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# Learning process promoted by sensemaking and trust: a study related to unexpected events

## Aprendizagem promovida por *sensemaking* e confiança: um estudo em um ambiente de eventos inesperados

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### Abstract

The objective of this study is to understand the interrelations among the micro processes which comprise sensemaking (WEICK, 1995) and the construction of trust (LUHMANN, 1996) in unexpected events. Unexpected events transcend routine and planning orders. However, when they happen, they demand from the organizations solutions as efficient and effectual as those programmed events. The methodology consists of the analysis of six semi-structured interviews and Conversation Analysis (CA) of the main extracts of the conversation between the agents and the supervisor from the beginning of event until its conclusion (recorded in real time). As empirical evidence, an unexpected event at the Operations Center of the Brazilian Electrical System (COS) of an important Brazilian state, on September 24 and 25, 2009 is investigated. The conclusion is that there is an interrelationship between micro processes of sensemaking, considered as ambiguity, experience and interactions, and the micro processes of trust, considered as complexity, familiarity and social behavior.

**Keywords:** sensemaking, trust, unexpected events.

### Resumo

O objetivo deste estudo é compreender as inter-relações entre os processos que compreendem sensemaking (Weick, 1995) e a construção de confiança (Luhmann, 1996), presentes em eventos inesperados. Acontecimentos inesperados transcendem a ordem da rotina e do planejamento. No entanto, quando eles acontecem, exigem das organizações soluções tão eficientes e eficazes como os eventos programados. A metodologia do presente trabalho consiste na análise de seis entrevistas semiestruturadas e análise da conversação (AC) dos extratos principais dos diálogos entre os agentes e o supervisor, desde o início do evento até sua conclusão (gravadas em tempo real). Como evidência empírica é investigado um evento inesperado no Centro de Operação do Sistema Elétrico Brasileiro (COS) de um importante estado do Brasil, nos dias 24 e 25 de setembro de 2009. É possível concluir que existe uma inter-relação entre os microprocessos de sensemaking, considerados como ambiguidade, experiência e interações e os microprocessos de confiança, considerados como a complexidade, a familiaridade e o comportamento social.

**Palavras-chave:** criação de sentido, confiança, eventos inesperados.

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## Introduction

Unexpected events transcend the routine and planning orders, however, when they happen, they demand from the organizations solutions as efficient and effectual as those foreseen of programmed events. In this specific case of organizations whose characteristic of their activities involve constantly come upon with such events, an important management activity is the creation of learning situations to capacity of its management in the solution of problems. These organizations, when the decisions can not respond with efficiency to the unexpected events, usually the consequences are catastrophic, due to the type of activity of high risk which they are inserted, such as electric power companies, nuclear energy, hospital emergencies, aerial control towers, fire fighter teams among others.

Researches about the high reliability organizations (HRO) are present in the organizational studies, treating the questions about accidents and risk (PERROW, 1994, 1999, 2007; ROBERTS, 1990; STRAHLEN et al, 2008; WONG et al, 2005) making decisions (ROBERTS et al, 1994); failure on the organizational systems (ROBERTS, BEA, 2001; SCHULMAN et al, 2004) among other themes. In common it is the understanding that the HRO's build ways much more efficient to face unexpected events than other organizations.

Before an unpredictable situation, the responsible people try to understand the problem from the elements that make sense in their analysis structures (sensemaking), taking into account their experiences and the interactions with the work group, so that, finally, find the possible and efficient decision. The comprehension of sensemaking process (WEICK, 1995) is critical in facing unpredictable situations, as well the search of diminution of complexity through the identification of familiarity in this situation (LUHMANN, 1996) in benefit of the most appropriate behavior for the situation at the moment. So, the objective of this study is to understand the interrelation produced among the micro processes which compound the sensemaking (WEICK, 1995) and the construction of trust (LUHMANN, 1996) present in unexpected events.

It was used as an object of study an unexpected event in the organizational context of an Operation Center of Brazilian Electrical System (COS) identifying its characteristics and repercussions of learning to the organization. It was analyzed from the acknowledgment process of the unexpected event up to the chosen decision. This COS is responsible for the generation control and electrical transmission of an important Brazilian state which has a population with more than 11 millions of inhabitants.

This empirical context of the research is characterized as an environment that works under constant pressure and surveillance, small errors may generate major consequences. More specifically, the problem of research is raised from the increase of the occurrence of crises which amount to environmental complexity in which the organizations, and particularly the High Reliability Organizations (WEICK; SUTCLIFFE, 2001), face daily. To achieve the objective, initially shall be submitted the theoretical on sensemaking, trust and learning, then be presented the empirical and methodological procedures, accompanied by the analysis of data, and finally with the proposed theoretical framework.

## 2. Theoretical referential

### 2.1 Sensemaking as a starting point

*Sensemaking* is a theoretical concept which brings new perspective for the understanding of organizations (WEICK, 1995), because it gets the intent to relate the action with the organizational context via as people create meaning from the elements of its experience, as well as of the cultural and discursive context in which they are inserted in that instant (BORGES e GONÇALO, 2009). For Weick (1969, 1995, 2005), the organizations must be understood as dynamic processes that suffer continually the influence of the actions of its members. *Sensemaking* is a cognitive process that individuals and groups are involved in the search for the resolution of complex situations through the diminution of ambiguity of problematic events in the organizations (*organizing*). Indeed, *sensemaking* involves the retrospective process of plausible images that rationalize what people are doing through the involvement of identity in the social context for the extraction of traces which create certain order in events (WEICK et al, 2005).

For that sensemaking efforts occur it is necessary that something happens differently from the expected (WEICK et al, 2005), as a flow of events demonstrates discrepancy of signs or tracks and maladjustment expectations. In the face of the surprise, we try to recall something similar and not finding anything we start the speculations about what is happening. Some assumptions then arise and people start to discuss because the contacts are crucial in the construction and perception of the problem which involve identity or reputation ((BORGES; GONÇALO, 2009, p.186; WEICK, 1995). (.

Therefore, unexpected circumstances which break the organizational routine are explicitly understood in words which reflect actions and choices, which precede objectives and plans (ANDERSON, 2006; WEICK et al, 2005). Thus, the expectations (representatives of the order and the routine) present different from the experiences (which refer to the disorder and to the unexpected) (BALOGUM; JOHNSON, 2005; WEICK; WESTLEY, 1996). When this break of expectation in the proceedings occurs, the routines and standards are faced as problematic moments of interruption in the procedural operation that needs to be repaired through the choice of a solution of problems; however the process continues vulnerable to another interruption (WEICK, 1995).

The High Reliability Organizations (HROs) are characterized by presenting a higher resistance to several breaks. In HROs, despite the errors can generate catastrophic consequences, they can be avoided, because the reliability is as important as the results of these organizations (ROBERTS et al, 1994).

Weick, Sutcliffe, Obstfeld (1999) have recommended that the HROs are precursor organizational forms of adaptation in an environment increasingly complex. For these authors, the HROs are environments in which prevail uncertainty and an apparent exoticism, but provide the cognitive infra-structure which allows the simultaneous and adaptive learning and reliable performance (p. 81). These organizations are specialists in making rapid decisions based on imperfect data and they know how to abandon routines in favor of improvisations (WALLER; ROBERTS, 2003, p. 813).

Karl Weick has drawn attention to the fact that deficiencies in attention are sources of accidents (PERROW, 2009). Weick and Sutcliffe (2001) consider that the organizations that need high performance in industry/sectors in which small failures cause serious effects, such as aerial control systems, medical emergency or negotiation with hostages. These organizations "do not have choice" but work in a highly reliable way. For this, there are some practices, which promote a reliable environment, susceptible of learning, which occur with these organizations (Figure 1).

**Figure 1: Characteristics of practices checked in the HRO's.**

HRO characteristics	Description
Preoccupation with failure	Don't underestimate small shortcomings and consider them as a symptom that something is wrong, trying to understand the system currently (organizational dynamics).
Reluctance to accept simplifications	HRO know that the world is complex, and unstable, unknown and unpredictable. Don't underestimate the complexity and attempt to explain the various aspects involved in each situation. How? Promoting debate with people of different points of view, without destroying the diversity. More vision with smaller simplification.
Sensitivity to the operations	Importance to the operations of how the work is carried out- to understand that events are situational (dynamic) and that there are 'latent failures' in the operational.
Compromise with the resilience	Consider that no system is perfect. Resilience is a combination of small errors and makeshift solutions which make the system works. For that it is necessary the work of experts, people with experience, skills of recombination and training in people with characteristics to be mentally stimulants.
Deference to <i>expertise</i>	Migration of the hierarchy/leadership for people with greater expertise in the area, according to the situation. Decisions are taken in the front line, by people with conditions to resolve the situation and not necessarily comply with the hierarchy.

Source: WEICK and SUTCLIFFE, (2001).

## 2.2 Reliability

The theme trust is considered a controversial approach with different approaches originated in the field of psychology, sociology and the economy, which led to different definitions (SINGH; SIRDESHMUKH, 2000) which bring value to the concept (ROUSSEAU et al., 1998).

In organizational studies, trust is studied under inter organizational and intra organizational aspects (ROUSSEAU et al., 1998; LANE & BACHMAN, 2002). For the understanding of building trust in cognitive processes, shall be considered the trust under the intra organizational aspect. Under this point of view, trust is understood as a cultural complex topic of organizations (ALLEE, 2000), as a factor of success for successful cooperation among teams (HERZOG, 2001). It is as a sustaining of individual and organizational effectiveness (McALLISTER, 1995), more as a cause than as a consequence of economic result of changes (ZUCKER, 1986), finally, as a 'meso' integrator concept of several levels including since psychological processes to institutional arrangements (ROUSSEAU et al., 1998).

A general consensus among researchers concluded that the intra organizational trust (within) is important in a range of activities and organizational processes, such as teamwork, leadership, direction of the objectives, evaluation of performance and cooperative behavior that benefits the organizations and its members (AXELROD, 1984; GAMBETTA, 1988; KRAMER, 1999; McALLISTER, 1995.).

In the face of the various approaches that trust is dealt with, among the studies that emphasize understanding inter relational trust (CHO, 2006; McALLISTER, 1995; LEWIS; WEIGERT, 1985; WHITENER et al., 1998), the ideas of Luhmann (1996) they seem to be fundamental. The sociological theory contributes in a fundamental manner for understanding the complex role of trust (MEYER et al., 2008) mainly through the analysis neo-functionalist of Luhmann that identifies, in the trust, the possibility to manager the complexity of modern societies (GILBERT, 1998) putting thereby trust in the center of sociological theorizations in contemporary societies (LEWIS; WEIGERT, 1985).

Trust, in Luhmann's understanding (1996) is the way in which people can better deal with the complexity produced by the social dimension of human existence. The search for the reduction of complexity can be conducted through the cognitive frame in a system that seeks similarity and familiarity in a world in which the social dimension increases complexity. The trust provides a basis to increase the possibilities of experience and action in this world, even if the risk of increasing the complexity provides a structure that can reduce complexity. The familiarity and trust are complementary forms to absorb the complexity and are linked in the same way as the past with the future.

Thus, "to show trust is to anticipate the future" (LUHMANN, 1996, p. 15), because the trust can only keep itself in the present, because the future is "an excessive burden for the ability of representation of man", so is endeavoring to simplify it and so reducing its complexity, through an attempt to project the future, and guarantee it.

Another important characteristic of Luhmann's theory (1996) is the inter subjectivity, since it is through it that the sense is organized to tackle complex conditions, so that the capacity of trust varies according to the sense and the world are constituted inter subjectively. What happens is that this constitution is not aware and rational, that is why the familiarity is simple, but fragile, therefore, at the same time it shelters reliable expectations and it contains some risk.

Thus, for the familiarity, the past prevails over the present and the future, that is why the complexity is to be reduced, that is why the history is the most important to reduce the complexity. If there is trust that familiar behaviors (from the past) will remain, there is the solution of a social problem: the exclusion of the expectation of action unexpected. That is why the trust is only possible in a familiar world; because it needs history as a reliable background. When the facts show that this expectation is not accomplished, it arises the trust in the social systems that they are based in the inter subjective constitution, standing out of a trust purely interpersonal for a trust in the system that implicates to resign to largest information, as well as a control of results. The trust in the system doesn't only refer to social systems, but to other people seen as personal systems. The change of the interpersonal trust to the trust in the system is defined in emotional terms, more than in terms of presentation.

## 2.3 Learning

The concept of organizational learning showed as a strong explanatory value to face unexpected events in organizations. The competitive context in which the organizations are inserted, indicates the organizational learning as favoring for the survival of organizations to the extent that it can promote innovation in products and processes (SOUZA, 2004), as well as the capacity to face at critical moments.

For Fiol and Lyles (1985), the learning is of strategic importance as a process of actions for improvement which extend the knowledge and understanding which implies improving organizational results. Therefore, the organizational learning enables the company to build an interpretation and an understanding of the environment in which it is inserted allowing viable evaluation of strategies.

On the other hand, Crossan et al (1999) consider that learning is a means to achieve what they call strategic renewal and they developed a model for the process of organizational learning. This learning structure presents four assumptions: constant tension between exploration and exploitation; cognition affects the action and vice-versa; multilevel (individual, group and organizational), which interact with the social processes of psychological intuition, interpretation, integration and institutionalization.

For Weick and Westley (1996) organizational learning is an oxymoron, because they are antagonistic processes. "Learning is to disorganize and to increase the variety. Organize is forgetting and reducing the variety"(p.361). This antithesis means that learning is possible in social spaces which added the order and disorder at a healthy tension, which include moments of humor, improvisation and small victories. Understanding the organization such as culture helps us to comprehend the nature of learning, because the culture is inserted in visible products such as language, artifacts and routines of coordinated actions. Thus, the invisible (social relations) makes it manifest in tangible (artifacts as models).

The relationship between learning and organization is essentially a tension. The adhocratic organizations are more skilled in adapting themselves in mutant environments, because they are self-developed organizations, while the bureaucratic are directed to the efficiency and to reap the benefits of learning curve, to the distinctions and clear rationalities they try to reduce or hide confusing or contradictory qualities. Both exploit positions more advantageous, the challenge is to find an intermediate point between the two structures, in other words, an optimal juxtaposition between order and disorder, not by the alternation between the two, but through an intimate and continuous connection between them (WEICK; WESTLEY, 1996).

Thus, for Weick and Westley (1996) the organizational learning is both as a result is a process. The learning depends, but is not exclusive of individuals, since there is also an organizational structure, such as culture which appears in language, words, phrases, words and expressions that groups develop, in artifacts, in material objects that a group produces. Organizations may develop themselves, when looking for small continual or bureaucratic changes when they are searching for efficiency.

The self-developed organizations learn while the bureaucratic ones organize. The learning depends on the language in social interaction, which is its instrument and repository (WEICK; WESTLEY, 1996). Therefore, learning is a moment in routine actions when order and disorder overlap (errors, almost accidents, etc) like finding permeable areas in a waterproof tissue. As a feature, the learning organizations retain redundancy elements, disorder and flexibility, in which the border between planning and doing disappears. Improvisation confers a new meaning to experiences, since they vary, combine and recombine a set of figures which gives coherence to the whole piece, as in a puzzle. Finally, for Weick and Westley (1996), the organizational learning is next to the aesthetics of incompleteness.

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## 3. The empirical and methodological procedures

In a developing country such as Brazil, the substructure electric needs to be trusted to ensure the expansion of supply and avoid new supply crises in 2009 and 2010 (CORREIA et al., 2006). The author refers to the crisis as the unexpected event of November 10, 2009 in which 60 million Brazilians were in the dark due to an electric blackout that reached 18 of 26 Brazilian states and left them without electricity up to four hours (BROOKS, 2009). This suggests the need for research of electric COS included as High Reliability Organization - HRO.

According to Weick and Sutcliffe (2001), HRO's operating under extreme conditions, such as recorded in the context of the Center of Operations of the System (COS). They have developed more effective behavior to deal with the unexpected than the traditional organizations and they can also teach them.

The COS has a responsibility to supervise and monitor the system of transmission and generation of energy of its State enabling the energy supply to concessionaires of distribution, as well as the free consumers, independent producers and other generation companies. The main objective of COS is to maintain the consumers supplied of electric energy.

The analyzed unexpected event occurred in two hydroelectric power plants in this Brazilian State, on September 24 and 25, 2009, which was supervised by COS. To analyze this unexpected event, the adopted methodological procedures were:

- a) Interviews - Six semi-structured interviews conducted with the various hierarchical levels of COS, since the management until the forwarding agents (operators who control panels).
- b) Analysis of the Conversation (AC) - Analysis of the main extracts of the conversation between the agents and the supervisor since the beginning of event until its conclusion (recorded in real time).

### **3.1 Understanding the analysis of conversation**

The social sciences recognize that language is a symbolic resource essential for the understanding of social reality, as Berger and Luckmann (1966) (SAMRA- FREDERICKS, 2003). In this context, speech is understood as a form of social action (CLIFTON, 2006). The use of the analysis of the Conversation (AC) in organizational studies situated in the work which examines the various institutional contexts, such as organizational environments, which is exalted the role of speech in the production of social life. If the speech is action, (SAMRA-FREDERICKS, 2003) then, "organizations are talk, and talk is organizations" (CLIFTON, 2006, p. 202). The use of AC in organizational studies is growing (NIELSEN, 2009; CLIFTON, 2006), and research are showing different aspects that the AC may contribute to the organizational studies. The objective of AC is to describe the powers and procedures involved in the production of the various types of social interactions (ARMINEN, 1999). According to Stephen Levinson (1983), the AC has its origin in Ethno methodology, movement that studies the methods of ethnic (own participants) production and interpretation of the social interaction. Understood as locally produced ('here and now' in the course of action), endogenously (within the situation), audio visual and interaction by the participants (FLICK, 2004).

Therefore, the Ethno methodology reappoints social order as phenomenon built in the ordinary and everyday actions of members of the social group, recognizing that Ethno methodology was founded by Harold Garfinkel (1967) and deals with the question of how people produce the social reality in interactive process and through this. Social Reality calls identifying these actions with the social context (McCLEARY, 2009).

The central concern of this approach is the study of the methods employed by members in the production of the reality of daily life. The research program ethno methodological is characterized by interest in daily activities, in its implementation and in the constitution of a context of interaction, locally oriented in which they carry out the activities. In general, the ethno methodological research program is performed in empirical studies of the analysis of the Conversation (FLICK, 2004).

The predecessor of AC is Harvey Sacks (1935 – 1975), scientist from the department of sociology at the University of California firstly and after Irvine, between 1964 and 1972. For the predecessor of AC, Harvey Sacks, speech-in-interaction is systematically organized and deeply ordinate; its production is methodical and finally the analysis must be based on data which occurred naturally (HUTCHBY & WOOLFITT, 1998).

The object of analysis of AC is the speech in social interaction. The data from these natural interactions are recorded on tape and/or video, which emphasize the social role of the interaction as a sui generis autonomous reality (ARMINEN, 1999).

The focus of analysis of the conversation is not the subjective meaning for the participants, but how this interaction is organized. The topic of research is the study of daily life, it is therefore crucial the role of the context in which interactions occur. Each event of speech-in- interaction presents efforts of production of the

members there, that is, of conversational contributions of members. Finally, the Ethno methodology concern s with the description of the methods of the members, instead of their perspectives, to describe the process in study from inside (FLICK, 2004)

The focus of AC is in the sequence, because through the course of the conversation in interaction the speakers have, in the next sequence of shift, an understanding of what was the first part (see Example of Interaction 1). The basic tool of AC is the next-turn proof procedure, or is, the next shift may have a desirable or undesirable sequence, according to what the earlier speaker said. They are the properties of ordinary speech (HUTCHBY & WOOFFITT, 1998).

The telephone conversations are liable to be analyzed by the prospect of the Analysis of the Conversation. For Hutchby (2001), in telephone calls, some conversational typical events occur, such as the identity of the caller, who answers and who responds. For this author, the person who calls (caller) has a superior position, a form of social power, over who answers, because there is certainty of the identity of the caller. There are many ways that the normative structures of the interaction conversation on the telephone can be organized.

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#### 4. Data analysis

As an empirical evidence is analyzed an unexpected event in COS of an important Brazilian state, between September 24 and 25, 2009 in Taí and Salto Azul Hydroelectric Power Plants which produce 35% of the consumed load by the State.

To achieve the objectives of this study, we will start with the exposure of an unexpected event analyzed. On 24 September was verified an abnormal heating (point warm in the primary relation) of a flow transformer. To resolve this problem, considered routine in this context, was carried out the urgency disconnection of this processor. Thus, the Taí Plant began to operate in isolation of the system supplying the loads of two regions of the state. To cover the configuration of the operation were also disconnected three generators of Roberto Peres Plant.

After the conclusion of the maneuver, was carried out the process of interconnecting the plant of Taí and at 1.19 a.m. to Salto Azul (concerning Moment 1 in Figure 2). At the time of closure at the terminal of the circuit breaker Salto Azul Plant and its joining the system, or, at the time of the synchronism (close parallel) with the Taí Plant system, there was the automatic disconnecting of six generating units of Taí Plant, remaining the servicing of the loads of the area, until then isolated through the system by a line that was energized.

The operation of automatically terminates all the units generate flame-if disarmament, that is, the plant was disconnected automatically for the purposes of protection and not manually (FARIA et al, 2002). This disarmament occurred due to the failure of the operation of Salto Azul linked the circuit breaker of Tai Plant without taking into account the conditions of synchronism. As consequences were used several relays of overvoltage and there was discharge of CO2 cylinders, less in a generating unit because of a contact burning in a relay.

At 1.22 a.m. there was another mistake, this time of the operator of Taí (concerning Moment 2 in Figure 2), in which the operator opened several circuit breakers for resetting, and one of them was found opened. Thus, there was interruption of electricity in two cities, leaving more than 340 thousand people without supply of electric energy by four minutes. The generating units started operating again gradually until 3 hours and 28 minutes later. The delay was due to the inspection of machines. Preventing interruption on electric energy supply is one of the objectives of COS, as shown in the interviewee speech ED3:

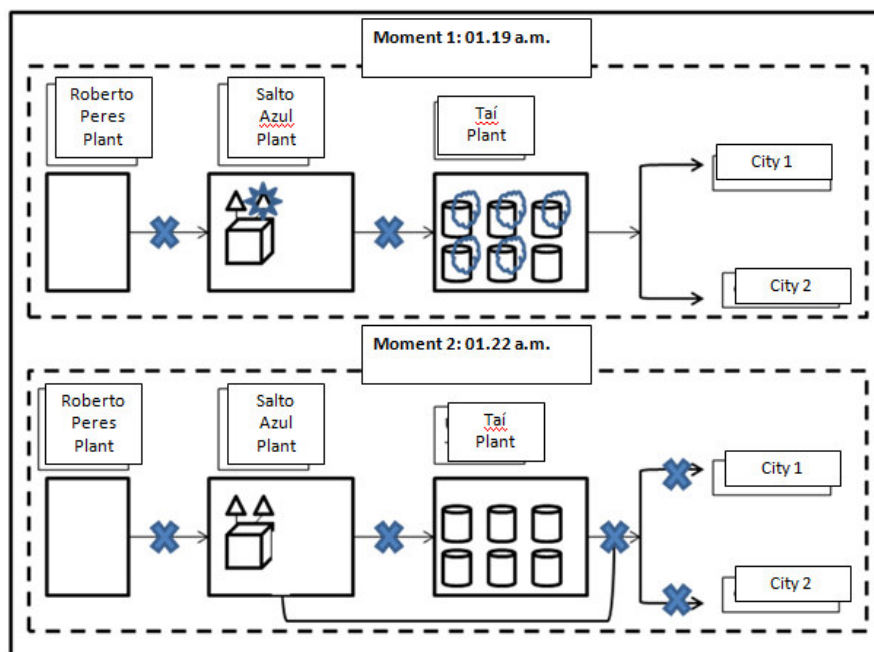
*This [the objective of COS] involves every moment to keep the lines and processors from the transmission system, which transmits energy throughout the state and controls the production of energy in the Plants.*

As a consequence, in addition to the two cities are without electricity for 4 minutes because the general disconnection of Taí Plant which operated isolated, after the completion of programmed maintenance in Salto Azul, Taí operation mistakably interpreted that the disarmament of six generating units was a general



disarmament and implemented the procedures of restarting fixed for the general disarmament [discharge of CO<sub>2</sub>].

**Figure 2: Representation of the two key moments of event**



Source: Data of this research

After the event, as steps were held meetings for clarification of the event, where they were discussed the procedures adopted in the event, identifying the causes that led to the misinterpretation of general disarmament and clarification of correct procedures to be carried out. It was also performed training of operators on procedures and the restrictions to be observed during the closure of parallel (synchronism) between the areas of the system of power. There was also a substitution of a damaged contact on the relay of the generating unit. In this environment the COS, all telephone conversations of the agents of the COS are recorded. The following, are presented and analyzed several excerpts of telephone conversations that highlight aspects of sensemaking and trust. The conversations selected does not cover all the context of the event, but referred to those categories which comply with the initial question of the article.

The telephone calls constitute one of the essential tools for the effectiveness of COS, since the operators centralize information of all the State, for this, they contact by telephone with the various sectors, enterprises, mills, among others, to receive routine information and manager them, as well as to act in cases of unexpected events. For this, such conversations contain an own script for the calls, for example:

1. Telephone call
2. Ana: It is Ana
3. Nilo: Ana, it is Nilo.

We can observe that, in this institutional environment, commonly they begin to talk through the identification of the names, thus Ana is a person who answered the telephone and the caller is Nilo. We note that there is subtraction of words conventionally accepted in telephone conversations as the "Hello" and "Who is speaking", for example, creating greater agility and objectivity in telephone call. Another feature of this institutional environment is the abbreviations of the names of equipment, operations, occurrence, etc. As Hutchby and Wooffitt (1998) in institutional interactions occur systematic reduction and specialization of various practices used in the daily life conversation, such as the examples by answering the calls.

For ethical considerations, all the names of institutions, companies, people, towns, mills and systems were exchanged for preserving anonymity, being replaced by other names chosen at random. Three were selected

excerpts of natural conversations recorded among the agents of COS and operators of the Plants involved in the event. These extracts were selected because they presented defined aspects in the objective of this study.

**Excerpt 1 (25/09/09 at 0h: 12min)**

((Nilo waits while Ana speaks on the radio with Zeno))

17 Ana: Nilo::

18 Nilo: ah.

19 Ana: now Zeno told me that it is burning part of R: of RPV that is there at LV:: that there is a hot point up on the transformer

20 Nilo: (.) O.K. What's up? : Z. What does Zeno want to do?

21 Ana: no. Only to tell you

22 Nilo: (.) >Is there the L up on the transformer?<

23 Ana: That's it . Aha

24 Nilo: (.) Barbarity! Good =

25 Ana: = you wait for something . I call you back, so that's o.k.

26 Nilo: What's up?. What do they want? Do they want to turn off the KZ? Make something:: what, what:.

27 Ana: no. Everything is turned off for us. For that reason we've done it: now the people from the transmission are there . They're in the dark there. Zeno went to take lanterns to check XXX XX that's o.k.?

28 Nilo: That's alright. O.k., that's O.k.

((they hang up the telephone))

Obs.: See transcription conventions in Note 1

In this excerpt, it is clear the context of urgency that the team from COS works. Ana is operating the Plant Salto Azul and Nilo, COS agent. We observe that Ana reports in line 19 an occurrence of a fire in a processor. The narrative is carried out in calm, without a hurry, being the first part of the pair in the conversation. As the second part of the pair (line 20), Nilo remains a moment in silence and either investigate what type of action he (representing the COS) may take, but Ana only describes what happened and reiterates "only to talk to you ". The "no" of 21 and 27 line shows as a not preferred answer in format of preferred action (HUTCHBY; WOOFFITT, 1998), or is, a negative simple, direct and without delay. This negative Nilo, held in line 22 a rapid formulation "is there the L on the top of the transformer?"

The objective of the formulation is to understand what both of the inter agents were doing together (ANTAKI; BARNES; LEUDAR, 2005), or, through the formulation it is possible to clarify the explicit sense of what was said (DREW, 2003). As the formulation occurs in conversational adjacent pairs (line 22), there is a preference to agree in the second part of the adjacent pair (line 23), through the expression 'this Aha' because after a formulation the other must recognize it and ratify it (HERITAGE; WATSON, 1979 apud ANTAKI et al, 2005).

In line 24, Nilo speaks with low tone of voice the regional expression "barbarity" which may be meaning 'what an absurd thing '. Nilo intends to continue with his shift of speech using the marker "Good" when Ana self-selects in line 25 to close the conversation, causing an interruption in Nilo's shift. The interruption may be interpreted as an instrument of control and power (OSTERMANN, 2006), reaffirming the willingness of Ana to close the conversation with Nilo. We notice that, at the same time that Ana intends to terminate the conversation, Nilo is not satisfied with the end of the conversation and he makes an overlap (lines 25 and 26). As Hutchby & Wooffitt (1998), the overlap is characterized as a superposition of speech between the inter agents, because through its marking, important points in the management of the conversation may be revealed.

In line 26, this overlap seems to be indicating the necessity and urgency that Nilo shows to assist in the resolution of the fire on transformer, not agreeing with Ana's calm way, he does not lead to the ending of conversation. Thus, we observe that Nilo's memory is seeking ways to act in front of the fire event on the processor, to which Ana tries to calm him and she produces large quantity of speech explaining the actions performed at the mill, ending with the expression "is it good?" We can understand that Ana makes an explanation (account) on her actions (line 26) which aims to avoid negative inferences about her, so that the construction of her version about reality seems to be solid and not problematic (POTTER, 1996 *apud* PASSUELO e OSTERMANN, 2007). Ana get to convince Nilo with her explanation since he reaffirms his concordance three times (line 28): "that's o.k., good, it is o.k." in preferred format. Even so, we note that Nilo is oriented toward the attainment of the task in the institutional interaction and he does not want to quit it, not even of his institutional identity, characterizing the institutional speech-in-interaction (DREW; HERITAGE, 1992).

Through this analysis it is possible to involve actions of inter agents that were explicit in excerpt 1 with the micro processes that comprise the sensemaking (WEICK, 1995). For example, in line 19, where Ana reports the fire incident on the processor in a calm way, Nilo perceives that there is equivocation between the content of the news and the quiet way of reporting it, to which he reacts with a brief silence and asks what kind of action he may take before the event.

For Weick (1969), ambiguity refers to the excess of a sense of information. Thus, the line 19 caused excess of sense in the information (equivocation between the content of the news and the quiet way of reporting it). Nilo tries to diminish the ambiguity through the questions of lines 22 and 26. We notice that the event causes complexity of Nilo's understanding. Complexity for Luhmann (1996) occurs when the possibilities exceed the capacity of response, as verified in line 26 when Nilo questions: "Do you want me to turn off the KZ? Make something:: what, what:.". We can see in this line that Nilo demands in his memory actions which could be carried out to help solve the fire event on processor, which can bring serious consequences. By trying to make sense of an event (sensemaking), the involved people seek in their experience some episode alike to be applied to the present event, as Nilo does in line 26, therefore creating sense is a process of attention to what it has already occurred, attention that was influenced by the current context of the subject and by the processes of memory (WEICK, 1969).

The unexpected is always within the possible of the HRO's, because there is sensitivity to the operations, or is, failures are liable to occur (WEICK; SUTCLIFFE, 2001), as it shows the speech of the interviewee EA2:

*Then the Center works with a forecast scheduled, but hardly ever what is programmed will not be implemented. It has a certain topic, certain routine, but it is not always true. There are situations that are totally unexpected, which are the occurrences.*

Therefore, we can notice that the excerpt 1 shows the start of the unexpected event and the dynamic presence of the micro processes of equivocation and experience (Sensemaking) and complexity (reliability) in an interrelated way.

#### **Excerpt 2 (25/09/2009 at 0h.20min)**

19 Ana: Nilo

20 Nilo: Me

21 Ana: It will be done by a XXX surveillance (.) connect the circuit breakers and close the disconnectors

22 Nilo: O.K. thus oh oh oh. Ana. Get someone who can give me more concrete information, put my feet on the ground. >Because I am not seeing you there< o.k.: I want to know what you are going to do, o.k.?

23 Ana: O.K.

24 Nilo: Get someone who can give me information. Thanks

((he hangs the telephone))

It is peculiar of interactions that occur in institutional contexts that inter agents preserve professional or institutional identity, because it is relevant in work activities in which they are involved (DREW and HERITAGE, 1992). The objective of inter agents is to maintain the public image, in other words, to maintain the image of "I" as delineated in terms of attributes socially approved and thus to preserve his or her face (GOFFMAN, 1955). We observe that in line 22, Nilo smites Ana's face by requesting another person who can give him more precise information. As the process of maintenance of face is a condition of interaction, but is not its objective, for the continuation of interactions and to achieve the objective of resolution of the emergent event, Nilo opts to request another person to continue treating the event and, therefore, he ends by injuring Ana's face.

Through this attitude, Nilo has shown that he does not consider Ana anymore into the category of reliable operator and that she does not have enough understanding to give clear information about what is happening in Salto Azul Plant. According to Silverman (1998), the categorization of the members in an institution involves the identity of workers as capable to understand and solve problems related to tasks of their work. In line 22, Nilo does not recognize Ana's actions within the category of efficient operator. Therefore, the speech of line 22 shows his reaction of this lack of frame through unfamiliarity, abnormality, therefore, he asks that another person passes the information, because he is not understanding what is happening in front of emergent event.

Carrying out the act of injuring Ana's face, Nilo understands that he is being aggressive, because he produces large quantity of speech, several explanations, repeats several times several words, as "me, me " and ends by requesting her understanding. We notice that Nilo takes some care, because he makes a pre-sequel when she says "O.K. thus oh, oh, oh" (line 22). The pre-sequence was used to design a new more delicate type of section (SILVERMAN, 1998). This time, it was Nilo who produced the explanation (account) on her actions (line 22). The explanation aims Ana not to make negative inferences about Nilo, so that her construction of version on reality seems to be solid and not problematic (POTTER, 1996 apud PASSUELO and OSTERMANN, 2007), through the explanation ">because I am not seeing you there<".

Ana's response in line 23 accepting to call another person, through the words "it's o.k." brings implications for the understanding of the asymmetrical discourse. One of them is the characterization of an asymmetric speech, because as Hutchby & Wooffitt (1998), the asymmetric speech is understood in terms of power of institutional officials to establish the opportunity of participation of the speakers and to define its outcome. It is common that the institutional interactions have the asymmetric character perceived in the distribution of shifts and controls of topics, such as shown in lines 22 and 23. The response of line 23 is preferred (agrees with the other interacting) preferred format (simple, direct and without delay) (HUTCHBY and WOUFFITT, 1998). We can notice that the interaction analyzed through the excerpt 2, shows that, for Nilo could create sense (sensemaking) of what was happening in Salto Azul Plant, he performs a conduct that may be understood within the micro-process of interaction (in the understanding of sensemaking) and the social behavior (in the understanding of trust).

As the individual behavior is contingent by the conduct of others and shows in its forms of speech, speech and conversation, because it is how the social contact is mediated (WEICK, 1995), we remark that Nilo makes a drastic action for the interaction by requesting that another person could pass the information. Such action occurred because he was not able to make sense of the situation in face of Ana's replies, so that he could reduce the equivocation and look for experiences that could help him to take attitudes for the resolution of the analyzed event.

Comparatively, we may analyze this attitude through the social behavior micro-process, because the social behavior is generator of complexity (LUHMANN, 1996) when the trust cannot be established for the reduction of complexity. Under this point of view, We note that Nilo shows that Ana (line 22) is not reliable, because the behavior of each person has symbolic implications and every action or inaction has possible effects on social behavior (LUHMANN, 1996), it is, in interaction. So, in this way, Nilo wishes to talk with another person, in order to make sense of the situation (sensemaking), as well as to build trust and so, diminish the ambiguity and complexity of the unexpected event.

**Excerpt 3 (25 /09/2009 at 1.27 a.m.)**

((Telephone call))

1 Aldo: Yes Aldo

2 Nilo: Aldo why RPV has called Fausto?

3 Aldo: what:? Disconnected the whole Taí XXX

4 Nilo: >It was connected with the Salto Azul<

5 Aldo: (.) So, wait:: I think that the operator:: made silliness then. Just a moment there

6 Nilo: Don't you have the voltage at Salto Azul? (0.4) ((voices at the bottom)) Hello. Hello. Hello:: >don't you have the voltage at Salto Azul?<

7 Aldo: (.) no no it is the following >we are taking the protections with all the sector turned off o.k.?

8 Nilo: but didn't you have the voltage of Salto Azul?

9 Aldo:What?

10 Nilo: Did you have the voltage of Salto Azul?

11 Aldo: I didn't. Salto Azul is disconnected

Aldo works in Taí Plant and Nilo is expediting of COS. This excerpt refers to the crucial moment of the event when happens the disconnection of six generating units of Taí Plant. The conversation between Nilo, dispatcher of COS, and Aldo, the Taí Plant operator, try to understand what is happening. By answering the telephone call, Aldo announces his name, in a characteristic telephone conversation of this institution. Notice that Nilo does not announce his name, and asks why the RPV concessionaire has called Fausto, as a warning sign that something is out of the expected. Observe that Nilo repeats Aldo's name, working as a pre-sequence for the issue of line 2, which involves the orientation for the task to understand what is happening with Taí Plant, since there are tracks of abnormality. The guidance for the task is particular to institutional environments (DREW E HERITAGE, 1992) and mainly HRO contexts. Note that Aldo responds with "what:?" showing astonishment, but soon he says "the whole Taí is disconnected" as a related event.

In line 4, Nilo makes the affirmation that Taí Plant was connected with the Salto Azul Plant that is the reason why it was disconnected. Remark that, in line 4, it is carried out a statement, and then repeat the same content in the form of confirmation (lines 6, 8 and 10). Through Nilo's affirmation, Aldo (line 5) makes a along pre-sequence "wait, then:" and makes a formulation concluding that "the operator made silliness", because through the formulation it is possible to clarify the explicit sense of what was said (DREW, 2003).

Because of the sense produced by this formulation, Aldo says "Just a moment", but Nilo keeps with his question, which was not answered. Nilo continues orienting himself to the task of discovering if Taí Plant received the voltage from Salto Azul, and he had to wait 4 seconds while he hears voices at the bottom. According to Weick and Sutcliffe (2001), the HROs take into consideration the different features of each situation, not underestimating the complexity and this appears at the interviewee ED3:

*The important in the occurrence is that you do not stick to only related contacts with the occurrence, because the world continues, you know? He is dealing with that occurrence, but the guy calls you for another thing and that interferes a lot.*

This feature is emphasized by the interviewee EA2 who alerts to the question of simultaneity of the happenings and the need of management, that involve the resilience and taken decisions in the front line, which are characteristics of HROs (WEICK; SUTCLIFFE, 2001).

Everything is simultaneously, then a person must talk to the distributor, one has to make an analysis of charge, or has other service and all these activities occur in parallel, so, there, one is the supervisor, one is the energy and other the electric, but these activities they are all interrelated, are not separated, the system is one thing only, then in the case of an occurrence or a contingency, they must work in harmony.

Returning to the analysis of trailer, Nilo tries to revive the conversation and calls: "Hello. Hello. Hello." (line 6), a characteristic used to call the interlocutor to telephone conversation. Aldo responds with a pre-sequence (line 7) after a moment in silence and the words "not, it is not the following" are not meaning preferred replies, but a pre-following the explanation (account) "we're picking up the protection". Note -that Aldo uses an engaging expression "us" as a way to refer to a representative action carried out by the employees of the Plant, common in an institutional context (DREW;HERITAGE, 1992). The account, aims the speaker to avoid negative inference about him (POTTER, 1996 *apud* PASSUELO; OSTERMANN, 2007) and it hopes that the other interacting agrees. Even with Nilo's concordance to the account through "O.K.", soon reorients to his initial doubt that is if Taí Plant receives voltage from Salto Azul Plant. Aldo, in line 11 answered the question like that: "had. no. Salto Azul is disconnected", it is, initially he says that it had voltage, after he denies and afterwards he makes an statement to let it clear that Salto Azul Plant is disconnected, it means, the Plant was automatically disconnected, not manually, for the purposes of protection, (FARIA et al, 2002), thereby achieving to clarify the explicit sense of what was said. The lack of maintenance of the connected equipment creates problems to the Institution, because part of these equipments is rent. Thus, when they are turned off they bring financial loss to the Company. We can notice that at the speech of the interviewee ED3:

*[Lack of energy for the consumers] is still a great variable, but it has another that is to maintain the equipment connected, because the equipment of [Institution] are hired and they must remain connected, if they are disconnected you lose money.*

Thus, we observe that in HROs environments the complexity is not underestimated (WEICK; SUTCLIFFE, 2001). In this excerpt, note that there is an emergent search for understanding the various aspects of the event, that Nilo is not satisfied until he clarifies his doubt. Aldo makes the sense (sensemaking) that there was operational failure (line 5) "I think that the operator made silliness", because they know the importance of how the work is performed (WEICK; SUTCLIFFE, 2001). It is interesting to hear that the sensemaking happened through a formulation which justly elucidates the explicit sense of what was said (DREW, 2003) at the time of the interaction. This shows the importance of micro process interaction, because creating sense is an individual and social process (WEICK, 1995). So are also the engaging actions as the use of "us" that also represent this micro process, because they refer to social contingency present in the sensemaking micro process interaction.

We observe that the trust micro process called social behavior is also present, because Aldo tries to maintain his integrity through the promotion of account, which aims avoid negative inferences on him, so that his construction of version about reality appears solid and not problematic (POTTER, 1996 *apud* PASSUELO; OSTERMANN, 2007). Thus, through the use of accounts, the trust social behavior micro process that is the search for integrity to guarantee the trust on the other (LUHMANN, 1996).

At the HROs, the learning shows essential in daily practice, because it is more resistant to interruptions (ROBERTS, 2005). It is the practice of the Institution, carry out analyses of events, meetings, trainings, among others, as shown in the speech of the interviewee ED3:

*An occurrence in the system can interrupt the consumption, may collapse a line, stay a time disconnected; you may lose money, there, an analysis of this occurrence you must go to the tenth box after the comma, to see what has generated it, what has not worked well, as it had to be and so we generate recommendations. [...] There is also an analysis meeting of occurrence which is a meeting held twice a month where you analyzes all the facts that has any margin of doubt, o.k.. And there we generate a recommendation, we put it at a map, and it goes to the responsible with a determined term.*

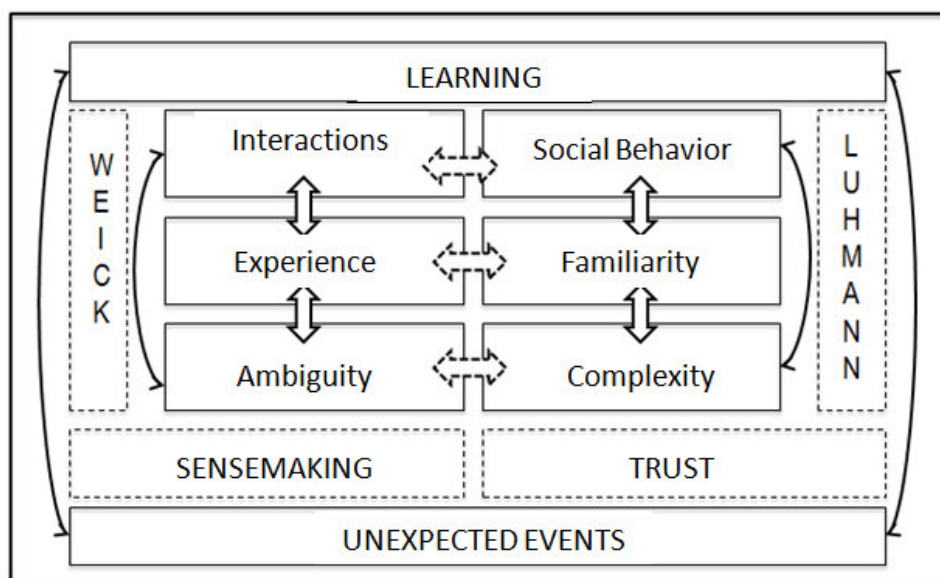
In the face of this environment complex, learning is possible in social spaces which overlaps the order and disorder at a healthy tension, which include moments of humor, improvisation and small victories (WEICK; WESTLEY, 2004). In this event, we observed these aspects, and also deliberations which indicate that there was learning, such as specific training with operators on the synchronism, in addition to technical corrections on the affected systems affected that have demonstrated defect.

## 5. Proposed theoretical framework

This article aimed to understand the interrelationship produced between micro processes comprising the sensemaking (WEICK, 1995) and trust building (LUHMANN, 1996) present in unexpected events. In the face of the development of methodology and analysis of the unexpected event, we propose an understanding theoretical framework for such events. We highlight the characteristic of theoretical framework is the understanding of complex problem in question, even losing part of its explanatory capacity when taken out of its context.

The proposed theoretical framework can be represented as Figure 3.

**Figure 3: Proposed theoretical framework**



Source: Data from this research

Through the results presented, it is possible to conclude that there is interrelationship between sensemaking micro processes, considered here as equivocation, experience and interactions and the trust micro processes, considered as complexity, familiarity and social behavior. The interrelationship between micro processes is also checked, since in the face of an unexpected situation it can occur equivocation that is the excess of sense of an information (WEICK, 1995), as well as the increase of complexity that it is when the possibilities exceed the capacity of answering (LUHMANN, 1996).

Analysis of data showed understanding of the sensemaking micro processes, as when the ambiguity should be reduced by seeking in the memory for similar experiences and ended with the interactions that stressed the mediation of the social contact. Other situations were better understood through the trust micro processes that began with the increase of the complexity and ended with the social behavior that presented effects with symbolic implications to trust.

So, the methodology of Analysis of the Conversation was useful for understanding the sensemaking and trust micro processes, because it is an approach that helps understanding the action of those involved in the conversation. Thereby, all the actions or inactions of interacting agents are recorded and analyzed. As an important conclusion of the work, we observed that the interaction (sensemaking) micro process has been produced by formulations. In AC, formulations sought to clarify the explicit sense of what was said (DREW, 2003), while in social behavior the interactional strategy applied was the *account*, it is, explanations which aim to avoid negative inferences about the interacting agent who speaks (POTTER, 1996 *apud* PASSUELO; OSTERMANN, 2007). Those are examples of actions of people inserted in a relational process seeking solution for unexpected events. We suggest these aspects should be deepening in further researches.

Therefore, in front of unexpected events in complex contexts, the analysis of rapid speech, decisions that surpasses hierarchy, highlighting small problems as initiating tracks of large consequences, formulations, accounts through AC methodology showed productive for the understanding of HRO's. And yet, the structure of the presented framework proved consistent to subsidize the understanding of the dynamics of unexpected events that culminate with learning in HROs environments.

As a limitation, we may mention few extracts analyzed, as well as the need for further research to validate the framework in other contexts and events. As managerial recommendations, it suggests that small operational failures are not highlighted in the organizational routine, that the interaction between the various people who are part of the organization should be valued and that the learning with small events should be put into effect in order to prevent further complications. Therefore, they will benefit from this understanding the organizations which made their management the nearest of HROs and which take into account the sensemaking and trust micro processes in their decisions to manager crises which lead to organizational learning.



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#### **Note 1** - Conventions of recorded interact telephone transcriptions

Source: Jung Lao and Ostermann (2005, p.88)

- [ indicates the initiation of an overlap of speech
- ] indicates the end of a superposition of speech
- = indicates that a shift is immediately to the next
- (.) indicate pause greater than three second
- ABC indicates emphatic intonation
- :: indicates lengthening the precedent sound
- ? indicates raising intonation
- . indicates a descendent intonation
- °abc° indicates a speech in lower voice
- > < indicates acceleration in speed of speech
- XXX indicates inability to hear what was said
- (( )) indicate the descriptions of conventional audio

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