

Improvisation at workplace and accident causation

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This report presents an application of the functional resonance analysis method for an exploratory study of accidents at workplace where some type of improvisation has taken place. Improvisation, along with creativity, can be seen as a basis for advancements in virtually all knowledge areas. The necessity to overcome a barrier, a difficulty, a discomfort, or any constraint can be a driving force for mankind to improvise - it is a natural act, a product of intelligence under unplanned circumstances as well as a way to cope with resource constraints. Despite the improvements improvisation can bring to society, it can also result in unwanted outputs, mainly when it is performed at the workplace, in hazardous and unknown situations. The main problem with improvisation occurs when its consequences are ignored and cannot be predictable, thus being able to lead to devastating events. So, why do firms improvise? The answer lies in the need to have the work done when faced with a demand. This research is essentially an exploratory study which aims at providing a better understanding of accidents resulting from improvisation at work.

Three accident reports, selected from open databases in Brazil, are presented to provide an overview of the extent to which improvisation can cause accidents at work. In order to study accidents resulting from improvisation, this research applied the Functional Resonance Analysis Method (FRAM). The three cases analysed had in common the lack of hazards recognition, planning, and supervision, as well as the pressure for productivity imposed by firms.

The method used to explore the three cases in this research was the Functional Resonance Analysis Method (FRAM), developed by Hollnagel [1]. This method was created to enhance the researchers' ability to investigate accidents and analyse risks and is based on the Resilience Engineering principles, mainly those which recognize failures and success as closely related phenomena, and not incompatible opposites.

The three cases were chosen from 35 accident reports analyzed by the Regional Labour and Employment Superintendence of Rio Grande do Sul [2]. The criteria used to choose them was the presence of, at least, one episode of improvisation to perform the assigned task. In

the first case, an experienced worker fell from an improvised ladder; In the second case, a worker suffered an electrical discharge during the operation of a concrete mixer using an improvised repair on the twine; and, finally, the third case describes an accident in which a worker was burned due to the use of an improvised solvent to clean a table near a flame. All the cases resulted in fatal injuries.

The cases highlighted some motivations which lead workers and managers to improvise at work in order to overcome a barrier. They are:

- owner's/manager's pressure on employees to finish their tasks and increase productivity (case 1);
- owner's/manager's pressure to save money (case 2);
- workers' hurry to complete tasks, no matter how, for fearing of losing their job (cases 1 and 2),
- worker's hurry to finish the assigned task (case 3)
- unawareness of the threats posed by improvised solutions (cases 1, 2 and 3)
- lack of process control by the owner/manager (cases 1, 2 and 3)
- lack of resources (cases 1, 2 and 3)

This study has explored the effect of improvisation of operational activities at work. Three cases from Brazilian companies were studied. As a general pattern, the observation of how improvisation worked in these cases brought some relevant findings to light: the lack of a safety culture allied to the pressure to finish tasks - at the expense of their own quality - created many risky situations. In addition, time pressure, fear of losing the job, lack of control and lack of resources also compelled workers to improvise without worrying about the possible consequences. [3] Although the cases analysed are not from the nuclear industry area, the lessons learnt may be applied to avoid the hazards of improvisation in the workplace in general.

References

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