How to Enhance Safety Rules through Human Error and Behavioural Control Strategies

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ABSTRACT

This article reviewed how to enhance safety rules through human error and behavioural control strategies. To understand what strategies could be applied safety rules, types of safety rules, safety violations, organisational factors, and behavioural types were explored. To complete this article twelve peer-reviewed articles and three statistical data sets were used based on the Fast-Moving Consumer Goods (FMCG) industry. The importance of safety is undisputed and the need for a holistic approach to enhance safety rules through human error and behavioural control strategies is required. Five key strategies to enhance safety rules through human error and behavioural control strategies include 1. Reducing the number and complexity of safety rules, 2. Consultation, 3. Data Banks, 4. Feedback 5. Proactive and Positive Leadership.

Keywords: Safety rules · Behavioral · Human error · Enhance · Peer Reviewed.

INTRODUCTION

Safety rules are commonly used in FMCG manufacturing industries globally. Having safety rules was not disputed in the twelve articles however the process in how they are created, deployed, measured, and reviewed was. The need for safety rules to be enhanced is evident in the 2.78 million annual fatalities due to workplace events. Safe Work Australia's reports 5-10% of fatalities in 2018 were related to manufacturing and increased in comparison to the prior five-year average. Safety rules in this article mean anything that directs an individual to do something in a certain way to deal with a certain scenario or outcome. Human error has evolved from the human being the root cause of events to now focusing on what motivated the human to comply or not comply with a safety rule. Behaviours are the underlying strategy that controls safety rules. Behaviours of employees and leader are explored as it impacts the safety climate of an organisation, safety participation and compliance with safety rules.

Method

This article provides an unbiased analysis of information. The search engines used: Science Direct, Google Scholar, and the University of Newcastle Library. The search criteria used the keywords: Safe, Rule, Behaviour, Behavioural, Control, Culture, Human Error, Work, Climate, Manufacturing, Organisation, and Participation.

90 articles were identified. Articles were excluded if they were not: in English, manufacturing industry, high-risk industry, or peer-reviewed. 32 articles fit the above criteria requiring me to review the Abstract. Articles were included if they referred to approaches enhancing safety rules, human error, or behavioural control strategies. Articles were not excluded if the abstract was similar to others as this would draw trends. 20 articles remained. A final thirteen articles were selected relying on twelve. IEEE referencing style has been used.

Results

Safety Rules
Safety rules can be described as restrictions limiting the autonomy of choice affecting the response and or outcome. These restrictions can limit new ideas and create bitterness, as a sense of control has been removed from an individual or group. People are more productive, fewer human errors are made and employees are more compliant if they assist in creating safety rules.

Safety rules can be categorised into performance objectives, procedural, and action. Implementation and management either use a top-down or bottom-up approach. Top-down does not involve consultation from the operators, nor does it allow room for deviation and is often associated with a negative, blaming culture. In comparison to

a bottom-up approach focusing on operator experience, feedback, and creating trust.

Safety rules are often used to achieve compliance with regulatory requirements. Action rules are commonly used to meet these obligations and making clear expectations for all parties. However, many countries have criticised the level of regulatory requirements. Creating action rules based on regulatory requirements focuses on the regulator's needs and not reducing risks. When cracks are identified with processes they are often resolved by new regulations, increased compliance hence more action rules. It also creates a master-servant relationship that has negative effects on workplace behaviours, safety participation, safety culture, and safety climate which is well supported in numerous articles

Rule Violations

Rule violations can be intentional or non-intentional. Intentional meaning the operator is aware they are violating the rule. Non-intentional meaning the operator is not aware of rule violation. Rule violations are then classified into routine, situational, exceptional, and optimising. Routine violations are the accepted norm. For example, too many violations are common and accepted. Situational is when existing rules are not appropriate. For example, an easier option is available. Exceptional is when unprecedented events occur, and a rule needs to be created or changed. Optimising is when competing interests take preference over the safety rule. Examples that drive these behaviours to violate are production goals, safety Key Performance Indicator (KPI) targets, time, efficiency, poor safety culture or climate, lack of safety participation, and undesirable safety behaviours.

Human Error

Human error can be categorised using Model 1 or 2. Model 1 focuses on rules that must be followed and if they are not followed, the person is at fault. Model 1 does not focus on the best outcome for the worker nor allows room for deviation. An example is, if a safety rule was not to use a sprinkler hose and it was, the human would be at fault. Model 2 focuses on workers' behaviours as a result. Model 2 would start the investigation at the human focusing on why the hose was used for example availability, purpose, expected outcome versus reality, or time. Model 2 allows room to deviate from the safety rule. Providing flexibility and ownership of rules promotes a positive safety climate and safety outcomes.

Leaders Behaviours

Leaders' behaviours impact organisational safety climate by influencing employees' behaviours with a rounded, balanced, or firm approach. A rounded approach focuses on collaboration between all parties from start to finish with positive means. This approach engages with employees as part of the process and in return, they will have ownership of the safety rules. A balanced approach uses facts and figures to make evidence-based decisions. A firm approach is communicating to workers they must

do the rule and if not, consequences apply. Each of these approaches impacts the individual's willingness with safety participation impacting safety climate.

Micro and Macro organisational factor

Micro and Macro organisational factors focus on how all levels of an organisation may influence compliance, behaviours, and safety participation. Micro factors are implemented by front-line employees and focus on processes, hazards, group cohesion, collaboration, knowledge, and approach to safety management. Macro-level factors are implemented by management and include the level of commitment to safety they have and socio-economic-related traits. These factors are powerful as they influence all levels of an organisation to drive a certain outcome and culture.

Safety climate

Safety climate is assessed by employees at a point in time of their perception of the safety values of an organisation versus the reality. Key factors which drive a positive safety climate include when safety is prioritised, employee health is valued, engagement, work pressures, operator knowledge, and procedures. For example, when organisations encourage certain safety values where the employee is at the heart of the decision this creates a positive safety climate.

Finding

When rules are simple and not too many, with frequent feedback on how safety rules are completed to workers, compliance with the rules increased from an estimated 26% to 69%. Two studies supported feedback to be more useful than training.

A study summarised 57 violations into the workers not being at fault, incorrect safety rule, or both. The key findings were using Model 1 and 2: deviation from safety rules directly related to when workers were measured on outcomes, workers with less experience adhered to the safety rules, self-motivated individuals were compliant, employees with more experience were less likely to adhere, and employee attitudes played a significant role in if they were or were not compliant. Other studies showed when fewer violations occur, it relates to a positive safety climate.

Limited articles were supportive of Data Banks being able to control risks more efficiently. The aim is a central repository of information for everyone to learn from each other based on past events. A current challenge with this method is determining a consistent framework to categorise safety rules. Similar types of databases were created in the 1960s however, most of these have since been abolished due to lack of a consistent framework. Some industry-specific data banks with a framework have reported benefits mostly when used before creating safety rules.

A study on a food manufacturing plant in the USA observed employees and categorised if the tasks completed were safe or unsafe. After obtaining baseline figures they implemented a behavioural based approach by consulting with

employees to classifying tasks as safe or unsafe, trained employees in the safe act, trained managers to provide frequent feedback, visual cues around the plant, and reported on the percentage of safe versus unsafe acts. Figure 1 shows the positive and direct impact of applying consistent positive feedback as a behavioural approach to improving safety performance. Within the year, the injury frequency rate decreased and flat-lined less than the time lost due to injuries per million hours worked. During the training and consultation phase, it was noted employees were conscious of the safety rules supporting frequent feedback was the key driver in achieving these results.
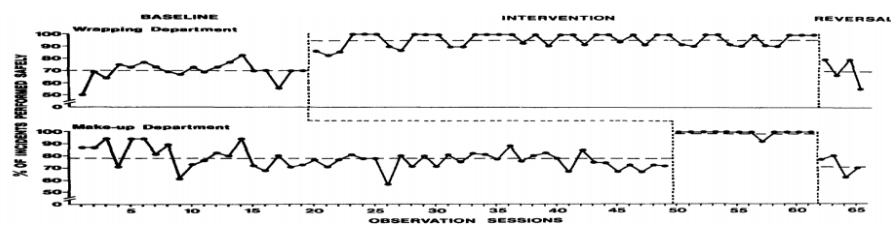

Fig. 1. Percentage of task completed safely versus unsafe completed by employees during a 25-week period in a food manufacturing plant.

Many European countries and Australia have distanced themselves from regulation-driven action rules now focusing on goals and outcomes. This approach focuses on the skills, knowledge, and judgment of the workforce. Creating a workplace culture that empowers and engages with employees throughout the complete process was supported by numerous case studies. These approaches can be compared with Australia's fatality rate of 3.8/100 000 and the USA rate of 3.2/100 000 during 1989-92. Australia's 2018 fatality rate is 1.1 / 100 000 and USA is 3.5 / 100 000.

A study completed on two UK manufacturing sites found that leaders' behaviours affected the organisational safety climate. By affecting the safety climate, the relationship with safety participation was positive. Rounded and balanced leadership attributes had the most effective impact based on consultation with employees and data-based decisions. Creating a safety climate founded on engagement, trust, and mutual respect, increased safety participation. In comparison to a firm approach only having negative outcomes on safety culture and safety participation.

202 French employees were questioned on the relationship between safety rules and safety climate. It focused on four key safety climate employee behaviour: safety feedback, management commitment, and employee involvement. It found positive affiliations between safety rules and safety climate when employees are appropriately trained the purpose safety rules and, as a team, could reflect on them.

Future research should be considered into team mindful organising defined as the

capability of a team to predict and get back on track following an unplanned occurrence. It assesses how teams collaborate, interacting behaviours, and characteristics. A case study completed on a Russian Chemical Plant found team mindful organising created a high standard of compliance and positive outcomes to safety participation and safety behaviours that were underpinned by strict compliance with safety rules. Given they are both high-risk industries, further research would confirm if the findings could be applied to an FMCG to enhance safety rules.

CONCLUSIONS

The main strategies to enhance safety rules through human error and behavioural control strategies are 1. Reducing the number and complexity of safety rules, 2. Consultation, 3. Data Banks, 4. Feedback, and 5. Proactive and Positive Leadership. Simpler, logical safety rules have greater levels of compliance which support new ideas, positive culture, and positive safety behaviours exist. By consulting with employees prior, during, and after a safety rule is implemented, made employees feel empowered, engaged, and fostered greater trust and mutual respect at all levels of an organisation. This joint approach must have cooperation to be successful. Data banks are not a widely used strategy however, positive outcomes were reported when industry-specific data banks were created using a consistent framework and reviewed before safety rule implementation. Positive feedback has a direct impact on safety participation and reducing injuries. Proactive and positive leadership is a powerful behavioural control strategy when executed appropriately. When combined, these strategies have a powerful and effective impact on enhancing safety rules. A single factor in isolation cannot achieve this and a multilayered approach must be considered to accomplish the best outcome.

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