

USING PARTICIPATORY VIDEO TO UNDERSTAND SUBCONTRACTED CONSTRUCTION WORKERS' SAFETY RULE VIOLATIONS

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Traditional approaches to managing occupational health and safety (OHS) adopt a top-down approach in which rules prescribing safe work procedures are written and enforced. However, these rules are sometimes broken. Violations are actions taken by workers that they know to be contrary to rules or procedures. Violations are a causal mechanism in some accidents and understanding why violations occur is important. Rather than actions taken by deviant workers, research suggests it is appropriate to understand violations as system problems. In some cases, rules are broken because the rules themselves are not practical given situational constraints, or because working to rule would impact the ability to meet production targets. In some instances managers are complicit in rule-breaking, quietly ignoring routine violations in the interests of getting the work done. A participatory video process was used with a group of subcontracted insulation installation workers in the Australian construction industry. In making videos about their work, the insulation installers reflexively critiqued their everyday work practices, shared information and identified and explained gaps between procedures and situated practices. Interviews conducted with workers revealed how the installers sometimes committed rule-based mistakes, unintentionally breaking rules because they were not aware of them, or did not understand or remember the content of complex written procedures. Other routine violations were necessitated by not having the correct equipment. The interviews also revealed how the (sub-contracted) insulation installers are routinely expected to violate standard operating procedures by general contractors, placing them at significant risk of coming into contact with live electricity or falling from roofs. The participatory video process provided a feed-back opportunity to understand rule violations and learn from situated practices, as well as a feed-forward opportunity to engage workers in the design of better rules. The interview data suggests the reflexive learning afforded by the participatory video approach also equipped the insulation installers with the knowledge and confidence to refuse to work in unsafe ways.

Keywords: rule violations, safety management, procedures, rule-based mistakes

INTRODUCTION

Safety rules and procedures are a fundamental component of an organisational safety management system. It is through the establishment of rules and procedures that managers' expectations for safe working are believed to be translated into the way work is actually done. Rules and procedures specify how a work process, task or activity should be undertaken, and are seen to be essential in the direction,

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standardisation and monitoring of work (Hale and Borys 2013). However, rules are not always followed.

Lawton (1998: 78) defines safety-related rule violations as “deliberate departures from rules that describe the safe or approved methods of performing a particular task or job.” Safety-related rule violations contribute to accidents and safety issues in many industries, including building (Mason 1997, Baiche *et al.*, 2006). Given their prevalence and potential for serious consequences, it is important that the causes of violations be understood. Alper and Karsh (2009) suggest that violations have not been more carefully studied because they are assumed to be actions taken by deviant workers. In reality, the causes of violations are complex and include individual, as well as environmental and system problems (von der Heyde *et al.*, 2015).

Not all violations take the same form or share the same causes. Lawton (1998) differentiates between acts committed with the intention to cause harm, for example acts of sabotage or terrorism, and those not intended to cause harm. Reason (2013) further classifies violations into: (i) routine violations, committed to cut corners, avoid unnecessary effort or bypass unworkable procedures, (ii) thrill-seeking/optimising violations, committed to make tasks more exciting or rewarding, (iii) necessary violations, committed just so that a job can be completed, and (iv) exceptional violations, committed during extreme one-off events when a system is operating outside normal parameters. Alper and Karsh (2009) also suggest that violations can be committed unintentionally. However, this contradicts Lawton's definition, which includes an element of behavioural intent. In this paper we refer to instances of unintentional rule-breaking as rule-based mistakes, rather than violations.

The study of rule violations has revealed a broad range of contributing factors (English and Branaghan 2012). For example, Alper and Karsh (2009) report that individual motivation, work system/organizational factors and aspects of the external environment interact to produce rule violations. Nordlöf *et al.*, (2015) report that workers' risk taking behaviour can be traced back to various social and technical risk factors. Nielsen *et al.*, (2015) provide evidence that workers with high male role norms are more likely to violate safety rules and less likely to report violations, causing particular concerns for male-dominated industries like building.

METHODS

We followed a group of insulation installers working in the Australian building industry in a participatory video process. This process afforded an ideal opportunity to understand situated work practices “from the inside-out” (Dekker 2003). In doing so we were able to explore the occurrence and causes of safety-related rule violations and identify the circumstances and motivations that lead workers to break safety rules.

Participatory video is a “group-based activity that develops participants' abilities by involving them in using video equipment creatively to record themselves and the world around them and to produce their own videos” (Shaw and Robertson, 1997, p1). Unlike observational cinema, participatory video is reflexive and in our case, the workers were both subjects and film-makers.

Workers were engaged in making films about the safety aspects of their work. On completion the worker-made films would be shared with other workers as safety training resources. The participatory video process was facilitated by an external consultant, who engaged workers in brainstorming content, developing a story board and filming their work. During the making of the film a member of the research team

observed the film-making and undertook video-recorded interviews exploring work practices and the occurrence and reasons for violations or rule-based mistakes. The workers themselves viewed video footage reflexively and were able to analyse, interpret and reconstruct their experiences from their own perspectives. The organisation's health and safety manager was also interviewed in order to explore her understanding of safety-related rule violations and reasons why they occur. The video and interview data were analysed independently and discussed by three of the authors until agreement was reached about emergent concepts and the evidence supporting these.

RESULTS

Unintentional rule breaking

The videos and interviews revealed several instances of unintentional rule breaking among the insulation installation workers. Some safety-related rules were routinely broken because workers' simply did not know that the rule existed. For example, during the making of the film, workers were engaged in discussion about the need to maintain 600mm clearance when using a nail gun to fix insulation adjacent to an electricity conduit. Several workers indicated they had no knowledge of this rule. One commented "Yeah the 600mm thing. I've heard it when we did an audit recently...but with the conduit and stuff like that, I haven't really steered 600mm clear of that." Another commented: "I actually didn't know about shooting all the pins 600mm either side of the conduit. That's one thing that I did not know personally....Yeah like I said I thought it would have been something that someone would have told me in my whole learning process of being here but obviously it doesn't seem to be happening. So that was probably the biggest eye opener that I didn't really know about."

The 600mm clearance requirement was documented in the standard operating procedure (SOP) for fixing insulation materials, however workers described how they did not read safety documentation in detail. One said "A lot of the times you just skim over it and you sign the back half the time. As bad as that may sound everyone does it....How often is someone going to actually sit down and read every little detail? I know we should and everyone should but when it comes down to it, no-one really hardly ever does."

LePlat (1998) identifies the accessibility and legibility of safety rules as being critical determinants of their implementation. In particular, it is important that workers are able to find and comprehend rules. The mode of presentation is likely to be a key factor in accessibility and legibility. In the case of the insulation workers, presenting rules in written form was observed to be problematic. The workers identified low levels of literacy as a reason why they did not want to read procedures. One commented: "There's just so much information and it's just not practical to sit there for three, four hours because I'm not very good with the English language so for me to read a document like that would take me half a day and they're not going to let you sit there and do that...you're also going to embarrass yourself in a room with 20 other people...so there's pressures to sign them off."

However, in the above quote, the worker also reveals how commercial pressures experienced by sub-contractors 'to get the job done' also interfere with the implementation and effectiveness of safety rules. This reflects what Iszatt-White (2007) describes as a 'gambit of compliance,' in which a box is ticked to say that

workers have read the SOP but no-one actually checks whether rules are properly understood and followed. In effect, building companies are ‘turning a blind eye’ in the interests of getting the work done.

Physical/site constraints

Other safety-related rule violations made by the insulation workers were made necessary by their physical work environment and/or the equipment provided to them. For example, the workers were filming the task of insulation installation in ceiling spaces in domestic buildings when it became apparent that it was practically impossible to follow the SOP for the task.

The work involved accessing ceiling manholes at a height of between 2.4 and 2.7 metres from the floor. The company’s SOP for the use of ladders and working at height requires that a straight ladder be placed at a 1:4 ratio and extend 900mm beyond the “step off” point. A script for the film was developed and distributed for comment. The health and safety manager commented that “no-one had an issue with [the script] theoretically.” However, on the day of the filming, the worker who was to undertake the task was furious, arguing that the script did not reflect the way the task is routinely undertaken. The health and safety manager describes how “shooting it [the film] and viewing it through the camera’s eye, we had to stop... the camera doesn’t lie.” She explained “to place a straight ladder at the 1:4 ratio just doesn’t work, you can’t get a body in there as well because it blocks off the access and you have to contort yourself to actually get in [to the ceiling space].” The requirement that the ladder extend 900mm beyond the “step off” point was physically impossible to achieve due to conduits, cables, beams and other obstructions. The small size of the manholes did not allow adequate entry for the ladder, the worker and the pack of insulation to be installed. The health and safety manager described how workers passing insulation packs into the ceiling space using a straight ladder had to contort their bodies to manoeuvre themselves into the ceiling space then move the ladder to get the packs in. She also explained that, if the workers used an “A-frame” ladder, “which they do because they can’t use a straight ladder,” they are forced to work unsafely because they have to step off the top rung of the A-frame. This practice is also in breach of the SOP for the use of ladders and working at height.

Iszatt-White (2007) identifies how formal safety documents are developed at a general level of abstraction, often by people who may not understand the applicability of rules or procedures to local conditions. In the case described, assumptions were made about the way work was being done and procedural violations had become accepted practice for the task. Dekker (2003) explains why it is important to continually monitor gaps between procedures and practices in order to properly understand informal systems of getting the work done. Where these are not safe, the fundamental issues of work design and equipment can be addressed. In this case, the participatory video revealed the need to reconsider equipment provided to workers and the company has since identified alternative access equipment that can be used to safely perform this task.

Supply chain pressures

The workers also described being asked and expected to violate SOPs by the builders (principal contractors) who engage their services. In some instances this led them to take potentially life-threatening risks. There is a serious risk of electrocution in the installation of insulation in buildings at which the electricity supply has already been turned on. For example, in 2010, an Australian national home insulation scheme was

halted because four workers' died as a result of electrocution while installing insulation in homes (Maiden 2010).

As part of the participatory video activity, the insulation workers made a film showing the practice of isolating and "locking out" the electricity supply before commencing installation work in buildings at which the electricity supply was live. The construction sites at which the installers work are typically under the control of a builder (principal contractor). The installers described how they often receive no information from builders about the location of cables in walls and ceilings or about whether any cables are live. One reflected: "if we're shooting into concrete with live wire, then you would think someone would say something, or show you a plan." The workers also discussed the resistance they face from builders who do not want to isolate the electricity supply, even temporarily, so that the installation workers can work safely. The health and safety manager described how the insulation firm had been threatened with termination of contract when a builder learned about the company's electrical isolation procedure. She describes how "a situation had developed out on site where it had become a gentleman's agreement between the trades and ourselves 'okay you need power so we won't isolate because of the inconvenience that it would cause out on job sites'. Rather than challenge the status quo, that situation had become expected."

This example shows how managers at the insulation firm were trying to look after their workers by implementing an electrical isolation procedure. However, there is an expectation among the builders who engage the insulation firm that safety-related rules will be bent or broken in order to get the job done. This is reflective of power relations between companies in which economic and reward pressures become successively greater towards the bottom of the supply chain. The problem is exacerbated because sub-contracted workers often work in small firms, are not represented by trade unions and experience job insecurity and precarious employment (Quinlan, 2011). Shooting nail guns into walls that possibly contain live electricity cabling is akin to playing "Russian roulette" but the workers' and health and safety manager's comments indicate that this risk is tacitly accepted (even expected) by builders. However, if an accident were to occur, blame would likely be quickly shifted to the worker who broke the rules (see also, LePlat 1998).

Empowerment of workers

Our final example also illustrates a general builders' expectation that the insulation installation workers deviate from SOPs to get the job done. However, this example suggests that the participatory video process changed one installer's understanding of safety and acceptance of taking risks. He describes how he refused to violate safe working procedures when he was asked by a builder to access a roof space from the outside of a residential building without an appropriate scaffold or access system. The worker described how correct procedure would be to access the roof space from an internal manhole inside the building. The builder did not want him to enter the nearly completed house and insisted the insulation worker access the space from the roof, which would have posed a serious risk of falling from height. The worker describes how he refused to work in this way, saying: "They wanted me to go in through the ceiling tiles to do some installation, and I just went....given what we've done [referring to his involvement in the participatory video process]... I know that's not the right way to do it, so I refused to do it. I said, 'Nah, I can't do it guys. Unless you can provide me with a handrail on the side of the house there, I am not going to do it.'

[They said] ‘Oh but every other installer does it that way...!’ [I said] ‘Well get one of the every other installers to do it mate, because I’m not doing it. It’s not the safest way to do it, it’s not the easiest way to do it...let’s be fair dinkum about it...’ ”

In this case the worker made an individual decision to refuse work rather than working in a way that put him at risk of falling from height. However, he also conceded that many other insulation installers would have complied with the builder’s request and unsafely accessed the roof space to complete the insulation work. Nordlöf *et al.*, (2015) describe how an individual’s belief that taking safety risks is an inherent or necessary part of their job influences their safety-related behaviour. In the example described above, the worker attributed his unwillingness to work unsafely to the participatory video process, which he believed had instilled in him an increased awareness of the importance of “going home safely” at the end of each working day.

DISCUSSION

Causal factors in rule-breaking

Violation is a pejorative word that suggests deviance and wrong-doing (Alper and Karsh 2009). However, understanding the occurrence and causes of safety-related rule violations is important because violations can lead to accidents. It is also important to identify when safety rules and procedures are not well suited to particular work tasks, situations or contexts. In these instances the rules themselves may need to be improved (Pilbeam *et al.*, 2016).

Our research shows how participatory video can be an effective way to understand situated practices from the perspectives of workers themselves. Participatory video is not just a data collection approach but it is, in part, also an intervention. The aim is not simply to produce video materials but to use the process of video production to generate critical thinking and "empower people with the confidence, skills and information they need to tackle their own issues" (Shaw and Robertson, 1997, 26).

In the case of the way the workers were using ladders to access ceiling spaces, the gap between the way work was documented in the SOPs, and the way it was routinely performed became apparent to the health and safety manager when making a film depicting this task (see, also Hollnagel, 2015). Workers had long experienced this gap between work as imagined and work as done, but the participatory video made it clear to workers that their knowledge is important and that it could be effectively communicated in the video. The participatory video opened up a valuable opportunity to learn from observing workers’ situated work practices and re-thinking the equipment needed for the job.

Our research shows how safety rule violations in the building industry are mundane, everyday occurrences. The violations that became apparent during the participatory video process were not deliberate acts of sabotage. Instead they are routinely undertaken (sometimes expected) and conveniently hidden from view. This is problematic because, when rule violations become routine and overlooked by managers, it becomes very unclear which rules can be broken and which must be complied with (Weichbrodt 2015). Ultimately this can produce what Snook (2002) calls “practical drift” whereby locally-situated work practices become progressively decoupled from written procedures to the point that procedures are routinely ignored.

Rule-based mistakes

The research revealed that workers break safety rules for many reasons. In some cases, rules were broken because workers were not aware of the rules. This may be partly due to the way in which information is typically communicated to workers in written or verbal instructions. The workers expressed a preference for receiving information about safety-related rules in visual (i.e. video) form. One commented: “It’s a lot easier to show someone what we’re trying to say. We could just sit here and verbally speak about it but if you put your verbal words into a video, people are going to sit back and go ‘now I know what he’s actually trying to say.’”

The difference between knowing what (or what not) to do and knowing how to do it was reiterated by another worker who commented: “I just think it’s a lot easier to visually show that you’re not to shoot a pin into this area, as to 500 words or something to describe the same thing.”

The idea that safety needs to be understood as a locally situated practice, that is not necessarily easy to describe in writing or in words reflects LePlat’s statement that “safety cannot be captured only by what is said of it” (LePlat 1998).

Production pressures

Our research also revealed how sub-contracted workers are sometimes put under pressure by builders (principal contractors) to work unsafely and in breach of safety-related rules established by their own company. Pressures to complete work and managers’ unwillingness to permit subcontracted workers to spend a lot of time learning about safety-related rules have been identified as factors contributing to rule violations in the petroleum industry (Dahl 2013). Guo *et al.*, (2016) also note that pressures to maintain production in construction projects reduces levels of compliance with safety-related rules.

The insulation installation workers we followed in our research are positioned at the lowest level in the building industry’s hierarchical supply chain. Our results reveal that, even when they know about the safety-related rules that apply to their work, the insulation workers are expected to break these rules by the builders who engage them.

The participatory video process was identified by one of the workers as being instrumental in his refusal to work unsafely when requested to do so by a builder. Other workers described how they used video materials to show builders (principal contractors) why they needed to follow the SOPs when performing high risk tasks. In this, the participatory video appears to have engendered greater understanding of the importance of safety, and a sense of solidarity among the insulation installers.

The role and interpretation of rules

LePlat (1998) observes that safety-related rules “have value only in as much as they are instruments for improving safety.” As safety management systems have become more prevalent, safety has been criticised as being overly “proceduralised” (see, for example, Bieder and Bourrier 2013).

It is generally acknowledged that procedures cannot cover all eventualities and, thus, workers use their judgement and experience to continuously transform rules into practice. Informal ways of working are important but are not always well understood or acknowledged. Ozmec *et al.*, (2015) describe how, in small business construction firms, work practices are constantly negotiated as workers draw on personal experience and emotions and constantly juggle safety issues with other considerations

relating to workflow, customer satisfaction and good work relations with supervisors and co-workers.

Dekker (2003) describes how safety is not always achieved through the rote following of rules. Rather, safety results from people being skilful at judging how to apply rules to particular contexts or situations. In some instances adaptation may be good for safety. However, this presents a “double bind” because although rules may need to be adapted in some situations, some adaptations can also fail with serious consequences (Dekker, 2003).

The role played by foremen in helping workers to translate safety-related rules into locally-situated practices has been noted (see, for example, Zohar and Luria, 2003). Previous research in the construction industry also reveals that supervisors identify formal procedures and safety-related administration as being a hindrance to effective safety leadership. They suggest that over-reliance on rules and enforcement of compliance is disempowering for workers and damages good supervisor-worker relationships that are important for safety (Conchie *et al.*, 2013). The insulation workers also identified the role played by foremen as being important in shaping how (and if) safety-related rules are followed. One commented: “Oh each job’s quite different really. Each foreman’s different, each builder’s different so it just depends on what you’re doing and how you’re doing it and how you have to do it. It all depends on different jobs or whatever.” Thus, given their pivotal role, the skill and experience of people in supervisory roles is critical to ensuring that informal ways of working are appropriate, that is, that the adaptations do not fail (see Dekker 2003).

Our research also highlights the potential for participatory video to help to identify and understand gaps between written or spoken procedures and locally situated work practices. In some instances, these gaps can be very instructive and suggest ways in which work processes or equipment need to be redesigned to enable safer ways of working. The gaps can also reveal problems inherent in the way that power relations in the construction supply chain can undermine organisational safety efforts, particularly in small firms engaged in sub-contract arrangements. In these circumstances pressures to “get the job done” are acutely felt and can result in a normalisation and acceptance of rule-breaking. Without understanding the underlying reasons for gaps between procedures and practice, it is impossible to deal appropriately with safety-related rule violations or mistakes. It is very unlikely that reminding workers to “follow the rules” would have been an effective remedial strategy in any of the situations of safety-related rule violations or rule-based mistakes we discovered.

CONCLUSIONS

Our research followed a participatory video approach to explore the occurrence and reasons for safety-related rule violations and rule-based mistakes in the Australian building industry. We followed a group of insulation installers working in the Australian building industry, who were engaged in making a film about their work practices. We observed the workers and interviewed them about how they worked and why. Several examples of safety-related rule violations and mistakes became apparent in the research. Reasons for these varied. Some were unintentional mistakes arising because workers did not know about safety-related rules. Other violations arose because of unsuitable equipment or because procedures were unworkable in certain situations. However, some safety-related rule violations were also tacitly accepted (even expected) by the builders who engaged the sub-contracted workers to

install insulation. These examples reveal significant issues related to supply chain commercial arrangements in the construction industry, and pressures placed upon workers to get the job done - even when this compromises their safety. Local conditions, time pressures and conflicting goals all shape the extent to which safety-related rules are practically followed. Understanding the causes of safety-related rule violations and mistakes is an important precursor to designing better rules and/or addressing some of the contextual impediments to their effectiveness. In this, participatory video is an effective and powerful way to engage workers in reflexively critiquing, explaining and reconstructing their experiences from their own perspective.

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