

# AN EXAMINATION OF SAFETY MEETINGS ON CONSTRUCTION SITES

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## ABSTRACT

Communication occurs in the way people understand what others are saying. On a construction site, meetings of various types are the arena where the participants should share their understandings on safety issues and topics. A considerable portion of work time in a project at hand is spent in meetings.

Meetings should promote work safety on a construction site, but do they? What is gained in the meetings? Are people truly participating or is a meeting just a “must” or a “play with a mutual manuscript”. The objective of this paper is to elaborate findings from project safety meetings in Finnish construction sites.

The research questions are: What issues are discussed in the course of safety meetings? How do the participants share their knowledge in the meetings? What issues or methods inspire the participants to discuss in the meetings? What could Lean Construction have to offer to the way we manage safety?

This paper begins by an introduction and a literature review to management culture and particularly to managing work safety. Then it provides data and analysis from observations of site meetings and interviews of workers and foremen.

The central occasions to promote work safety are various types of safety meetings at a construction site. Still, in this research the interviewees are rather critical to the effectiveness of the meetings and they emphasize the daily control of work safety. The safety meetings, in general, seem to be highly main-contractor –led. The sub-contractor’s workers have a very passive role in the meetings and interactive conversation emerges only in some meetings . The question remains: do we reach our safety goals through these kinds of meetings, or are these meetings a waste of time?

## KEYWORDS

Project meeting, safety, construction site, participation, talk, collaboration, lean construction

## INTRODUCTION

In this paper, we study the safety meetings of construction projects in Finland. The analysis of the meetings will provide a basis for discussion on how safety cooperation between a main contractor and a subcontractor and the meeting practices at construction sites should be developed. We will focus on the following research questions: What issues are discussed in the course of safety meetings? What kind of

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interaction takes place in meetings? What issues or methods inspire the participants to share their knowledge or ask questions in the meetings? What could Lean Construction have to offer to the way we manage safety?

First we will elaborate leadership and management issues concerning work safety through a literature review.

## **COMMUNICATION AND MANAGEMENT**

People and communication are essential in managing construction site production. Mary Parker Follett defined management already in the early twentieth century as "the art of getting things done through people". She believed in the power of people working together while respecting the contributions of the individual. This is something that seems to have been forgotten in many cases.

Projects require that people bring into play their unique perceptions, communication skills, agendas, social statuses and their own will with other human properties that affects the design, adherence to regulations and control intentions of the appointed managers (APM 2006). Traditionally project management relies on centralized planning and initiation of work, and on "thermostatic" control by tracking against standards (Howell et al. 2004). According to Woolf (2007) this "Command-and-Control" management style has dominated project management for centuries. On the other hand, Howell et al. (2004) argued that the historical common sense of management is challenged by a new definition of work and management put forward by Fernando Flores (1982), who sees management as a process of openness, listening, and eliciting commitments.

Projects are networks of commitments: "If one person fails to make the commitment he promised, it is a domino effect on every stakeholder in the project" (Pinch 2005). Conversation and communication are important and meetings are held to communicate. Meetings should be the heartbeat of organizations (Huttunen 2010), and a tool for getting things done in project organizations. Conversation in meetings is regulated by predetermined agendas that largely dictate the choice of topics available (Boden 1994). Lean Construction changes the way we work and communicate also in the meetings. Lean principles, methods and tools help to create collaboration between subcontractors, foremen and superintendents to plan the overall project schedule and delivery (Howell and Macomber 2006).

## **MANAGING WORK SAFETY**

Construction industry is one of the most hazardous industries resulting in high rates of accidents around the world (Maloney 2003), as well as in Finland (FAII 2011). Accidents are primarily seen as the result of poor safety culture expressed as unsafe practices and behavior. As the existence of poor safety practices leads to an increased risk to human lives, the industry has put a great deal of effort into the form of improving the organizational safety culture (Smith and Roth 1991). The focus has been on definitions, implications as well as on the measuring instruments used in assessing the safety status and conditions (Chinda 2009). Establishing a good and efficient safety culture undoubtedly helps organizations control and reduce construction costs and increases their long-term operational efficacy (Fung et al. 2005).

Construction companies have their own policies to ensure safety in the projects. In part, these policies are in response to requirements prescribed by law, such as the site

orientation of workers. In part, they are company-specific practices, like work safety quarters, with which the company aims at ensuring safe and efficient work in their projects. The subcontract's start-up meeting is a regulated meeting, which is held before the work begins. The participants are the subcontractor's foreman and work group head, the site manager and the foreman supervising the subcontract. The topics for the meeting include goals, schedule, work safety requirements and quality requirements for the work (Work Safety Administration 2011). The meeting is also the place to review the work safety plan made by the subcontractor.

Site orientation sessions aim at familiarizing the workers with the construction site and its organization, as well as risks specific to the site, work safety requirements and guidelines and the required personal safety equipment. The main contractor is responsible for organizing site orientation for every worker at the site and site orientation is required for obtaining a site pass (Work Safety Administration 2011).

In addition to the occasions described above, other work safety meetings focus on current work safety matters, such as work safety observation results, which are an important part in continuous improvement (Howell in Pinch 2005). The site management is responsible for the site, the ways of work on site and also for organizing meetings (Koski and Mäkelä 2006). The question is whether the current meeting and safety practices are functional.

## **MAKING SAFETY LEAN**

Construction accidents de-motivate workers, delay projects and adversely affect the overall cost, productivity and reputation of the construction industry (Mohamed, 1999). According to Lean Construction ideals, the goal is to build a project while maximizing value, minimizing waste and pursuing perfection (LCI 2012).

Several papers have been published on the relationship between lean production and safety performance. Howell et al. (2002) reviewed traditional safety management best practices and concluded that they were ineffective in making workers capable of performing at the edge of loss of control. Saurin et al. (2002, 2007) proposed a model and terminology for describing the relationship between lean and safety. Mitropoulos et al. (2005) propose that safety is an emergent property of production systems. Leino et al. (2010) describe how the safety program and production management program are tightly coupled together.

Leino and Elfving (2011) show how in the Last Planner™ system implementation zero accidents program is tightly coupled into the implementation plan. The common nominator in the successful implementation is workforce involvement (Leino and Elfving 2011). According to lean philosophy, all waste, including misuse of expertise in the organization, needs to be minimized (Liker 2004). People at work create safety in the workplaces with continually changing hazard sources (Schafer et al. 2008). Workers have the first hand knowledge on the task risks and obstacles. Considering the experience that a work crew has of dealing with the every-day construction work risks, they also have knowledge of hazard identification and respective preventative action (Leino and Elfving 2011). Lean principle of not releasing defective or incomplete work into the process also guides us to take care of the safety issues as a real part of production and not just do things as a camouflage. Management of work understood as "making and keeping commitments" changes the nature and focus of leadership and common sense (Howell et al. 2004).

## RESEARCH DATA AND METHODS

The data of the study was gathered as a part of “Transferring the safety culture between the main contractor and sub-contractors as a part of safety planning and management” –research (funded by The Finnish Work Environment Fund) in 2010. The data was collected by observing the construction project meetings, such as subcontractor start-up meetings (N=4), site orientation sessions (N=3) and various other weekly meetings (N=7) on several construction sites in Finland.

Site managers (N=8) and workers (N=7), main contractors (N=7) and subcontractors (N=8), were also interviewed. The interviews were conducted in a semi-structured manner, focusing on the themes presented but also allowing room for adapting to emerging topics. The questions related to this study were: How is the work safety of subcontractors ensured on the site before the work begins? What challenges does this entail? What are the safety practices during after-work has begun?

The meetings and interviews were audio-recorded and the data were transcribed *verbatim* and analyzed to answer the research questions. The observation data were analysed, using the ATLAS.ti analysis suite, for the distribution of speech of different parties in meetings, topics discussed or skipped over (e.g. safety plan at the start-up meeting) and topics discussed by the whole group. The distribution of speech was analysed by calculating the amount of words spoken by each person. The interview data were analysed in the same manner. During the analysis the data were tagged based on who was speaking, at which construction site, and on what topic. During the analysis phase the data were scrutinised several times in detail, ensuring that the most relevant themes were picked up.

The observation results will be amended with the interview results of the subjects of start-up meetings including the subcontract’s safety plan (N=20), site orientation sessions (N=93) and work safety quarter of an hour (i.e. 15 minutes) (N=3).

## FINDINGS

### START-UP MEETINGS

All subcontractor start-up meetings were conducted using a prepared agenda. The topics on the agenda were quite similar across the board. Safety matters were not a particularly central; the discussion revolved mostly around schedules, implementation methods and contractual limits. All meetings did, however, include safety issues, and the safety issues were the ones that the subcontractor also participated in.

The start-up meetings were highly main contractor -led. The subcontractors answered briefly to the main contractor’s questions, but most of the time, the subcontractors listened quietly to the main contractor talking. However, one start-up meeting (1) differed from the other meetings: a vivid discussion on working methods, tools and equipment concerning the subcontract arose. The main contractor was interested in the work practices used by the subcontractor, and asked detailed questions regarding work and safety: how the sub-contractor is going to take care of personal protection in painting work. This meeting also included an open discussion on how on site work safety should be taken care of. Due to the frequent questions from the main contractor the meeting was much more interactive than the other ones.

Main contractor: *But how will the men handle personal protection, because they can’t wear any kind of masks, can they?*

Subcontractor: *Well, they have the motorized ones.*

Main contractor: *But what about the eyes?*

Subcontractor: *Covered, we just bought these helmets here.*

Main contractor: *How the hell are they going to wear that?*

Subcontractor: *...They do have the film on the mask, the film is removable.* –N7–

**TOPICS THAT SPARKED DISCUSSION IN THE START-UP MEETINGS**

The safety topics touched upon by the actively participating subcontractors included i.e. protection and inspections during work, general work safety, site orientation, waste handling and cooperation on site. In one start-up meeting not a single one of these topics was discussed and in the same meeting safety matters were simply acknowledged by

*“Some of this stuff is really pointless drivel”* –N11– (main contractor, foreman)

Table 1. Observations from start-up meetings

	<b>SU-M1</b>	<b>SU-M2</b>	<b>SU-M3</b>	<b>SU-M4</b>
<b>Code</b>	N7	N9	N11a	N27
<b>Duration</b>	00:53:59	01:07:11	00:16:35	1:19:39
<b>Topic</b>	Painting	Concrete wall structures	Suspended ceiling	Demolition
<b>Word count</b>	1761	3999	834	5069
<b>Speech distr.</b>	MC 65 % / SC 35 %	MC 84 % / SC 16 %	MC 96 % / SC 4 %	MC 78% / SC 22 %
<b>Topics discussed</b>	- Contract <b>schedule</b>	- <b>contract limits</b>	- contract limits	- contract
<b>Topics with intense discussion highlighted in bold</b>	- production speed & working order - plans - quality assurance <b>inspections during work</b> <b>work-time protection</b> <b>work safety</b> and hot works - work safety plan <b>site orientation</b> <b>waste processing</b>	- <b>execution of work stages</b> - schedule - related works and problems <b>work safety matters</b> <b>cooperation at the construction site</b> - plans, use of Ratu	- workplace acceptance - plans, schedule - work order - informing of changes - personal work group - risks, work safety - quality, inspection following - workstage - participation in meetings - billing, signature	- arrangement - quality and safety systems - site orientation <b>schedule</b> - structural design plans - quality assurance <b>waste processing</b> <b>work safety</b>
<b>Description</b>	Solving problems together, consider options for improvement, main contractor asking if unfamiliar with subject, subcontractor discussing actively.	The MC goes through the work progression in detail, as if teaching the worker. The SC’s representative conforms, agrees with main contractor. The worker himself sits silent.	MC goes quickly through the topics, states that not all topics are relevant. <i>“This is a bit of pointless drivel here in parts.”</i> The subcontractor comments on few issues, “yes”, “ok”.	The main contractor goes through the agenda while occasionally discussing technical matters in great detail and planning the work together. Very little discussion.

Although the subcontractor’s work safety plan has a pivotal role in work planning and ensuring the safety of the subcontractor’s work, its role in the start-up meetings was not a central one. In some meetings it was entirely ignored. Other meetings it was asked about, but not presented, and only some contractor’s site management emphasized that a proper effort must be put into it.

*"I want to see that you have really put some effort into these, so that we can go over them once they're done. This is for the best both to you and your workers." – N7–*

### **START-UP MEETING AS A THEME IN INTERVIEWS**

The interviewees did not view the start-up meetings as work safety meetings. They stated that the start-up meetings were certainly important for cooperation, but that their emphasis lay in other matters than work safety. They told that work safety was touched upon in the form of the subcontractor's work safety plan, which was contradictory to what happened in the meetings. The interviewees also stated that the quality and the significance of work safety plans to actual work were actually minor. They told that in some cases the safety plan was only made because it was required, not to genuinely ensure work safety. The plan remained as an attachment to a contract, without being used at work in any way.

*"but the work safety plans are of very poor quality ... oftentimes the subcontractors do it as a contract attachment and it's just a bunch of somebody's thoughts. They haven't actually gone through it with their own crew. We at the site would like for them to do that more and properly, it would really serve them in their work" – N5–*

### **SITE ORIENTATION SESSIONS**

The site orientation sessions followed an orientation form as the agenda. Unlike in the start-up meetings, none of the sessions featured discussion between the foreman and the people receiving orientation. The sessions were nearly entirely monologs by the person responsible for orientation. The people receiving orientation did not bring up any discussion, they only replied in very few words when questions were asked. The questions mainly regarded personal information and work experience, not work safety, risks or work site conditions.

### **CHARACTERISTICS OF SITE ORIENTATION SESSIONS**

In a site orientation session (OS1) a foreman stated that it would be pointless going through the topics with such experienced workers. Also, he pointed out in the interview that not all things are necessary to everyone, and the actual orientation takes place during the round on the site. He is referring to the company's safety material with a sarcastic quip, showing that he does not believe deem the material to be of interest to the subcontractor.

*"Primary construction equipment and usage instructions, I don't think I'll need to lecture you about those.... The company safety material is here in the office, I'm sure you're very enthusiastic about reading it." –N11b– (main contractor foreman)*

In another orientation session (OS2) a subcontractor's foreman was briefing one of his own workers. The session focused on filling an orientation form, with which the foreman was helping the worker by practically holding his hand. The worker was a foreigner. He answered questions curtly in Finnish when asked, but did not particularly participate in the conversation.

In another orientation session (OS3) a main contractor was instructing several workers at once. None of the workers took part in the discussion, and even the main contractor's representative seemed bored. In the end he stated sardonically, that everything must have been clear since nobody had anything to ask.

	OS1	OS2	OS3
<b>Code</b>	N11b	N17	N25
<b>Duration</b>	00:10:00	00:38:03	00:25:23
<b>Topic</b>	Suspended ceiling	Demolition	HVAC installation
<b>Word count</b>	532	2042	1246
<b>Speech distribution</b>	O 99,8 % / W 0,2 %	O 99 % / W 1 %	O 98 % / W 2 %
<b>Description</b>	Main contractor goes through the topics quickly, using a list. <i>“There’s no point in lecturing you about the equipment”.</i>	A subcontractor’s foreman leads by hand how to fill out the form; name, job etc. The worker fills out the form himself.	Main contractor runs through a list of topics in a bored manner. None of the subcontractors participate in speaking.

Table 2. Observations from site orientation sessions

### SITE ORIENTATION AS A THEME IN INTERVIEWS

Site orientation was a central theme in the interviews. It was seen as pivotal safety work. However, the orientation practices and their effects on safety were subjected to harsh criticism. One subcontractor’s representative commented that the main contractor uses site orientation to avoid taking responsibility: a signed orientation form means that a subcontractor has all the necessary information and a main contractor thinks he is no longer responsible for anything.

*“It sometimes feels like some of the main contractors wash their hands of it, when something happens and somebody gets hurt, they are not responsible. They show the paper you have signed and tell that you’ve been given briefing and so forth.” N24*

Some of the interviewees did not even consider orientation important in itself, but that in practice work safety is enforced during work.

*“site orientation is a necessary evil, just ticking the boxes without thinking what the important thing behind this would be. ... work safety must not be left depending on site orientation, it needs to be brought up somewhere else or in practice” N5*

Orientation was found insufficient particularly with foreign workers, as there was no guarantee that the orientation talk was being understood. Work and practical understanding of safety matters must be supervised.

*“they say ‘I understand’, but when problems arise you see that they have not understood.” N1*

### A QUARTER OF AN HOUR DEVOTED TO WORK SAFETY

A quarter of an hour devoted to work safety is a weekly site meeting that focuses on current on site safety issues. The observed meeting lasted for 30 minutes and it was attended by the site management, workers and also by the management from another site. On the whole, the quarter of an hour devoted to work safety was very manager-led, like the other meetings.

The observed meeting started with an overview of the latest work safety observation results and safety-related cases from the current site and also from other construction sites. Next, a “near miss” situation was examined. The worker in

question told about the near miss situation and site management gave encouraging feedback to the workers while reminding everyone about how to act in such a situation. The chairman of the meeting also read a bulletin from the head office, regarding preparations for the approaching winter.

Finally, the management asked the workers to bring up some work safety observations, using the instructions received from the head office earlier. After a short silence one of the workers spoke up about a problem with insufficient lighting. A long discussion ensued, during which the workers told about the situation, asked for instructions and suggested multiple solutions. The workers took ten turns to speak, which was unusually active when compared to the other meetings. They asked for instructions on how to proceed, and challenged the management to respond, but also suggested their own solutions to problems.

In the interviews, these quarters of an hour devoted to work safety were considered less formal than other meetings, such as orientation sessions. The participants (e.g.) had coffee after the meeting. Foremen emphasized that it is crucial to have weekly meetings and that it is also important to bring up some positive feedback, not only the problems.

*“it’s an informal occasion, where the last week’s work safety situation is reviewed and ... you hear about any problems that have come up” –N –*

## CONCLUSIONS

According to the literature reviewed, a safe working environment is created by adhering to requirements ordained by law, following the company- and site-specific practices and promoting safe behaviour in all situations. Key occasions to promote work safety at construction sites are the site orientation sessions, the subcontract’s start-up meetings and the company-specific quarters of an hour devoted to work safety. Still, the interviews conducted in this research, showed that the every-day control, guidance and intervention are the ways to promote the importance of work safety, express the values that the site management truly foster and act in the spirit of continuous improvement.

According to these research data, the safety meetings are highly main-contractor – led, most of them follow a formal agenda and include only little, if any, conversation. As an extreme example, the workers in the orientation sessions did not participate in the conversation at all. They only replied in very few words when asked questions regarding their personal information and work experience. Work safety, risks or work site conditions were not topics under conversation.

Communication occurs when people understand what the others are saying. With conversation we can ensure mutual understanding and give promises, which are the fundamental units of interaction (Sull and Spinosa 2007). In the meetings under study, the quarters of an hour devoted to work safety inspired the most real conversation. These were informal, weekly meetings without a strict agenda. People were discussing actively, and workers were challenged to answer the foremen’s questions – and vice versa. These meetings appeared as far more communicative occasions than the other meetings.

When discussing safety, we often touch upon concepts such as “culture” and “attitude”. As this study shows, very few of the meetings held were interactive, happened in a good mood creating an atmosphere of a safe workplace and made a



difference concerning the attitude, and more importantly, the behaviour of the participants. The mood of a meeting has an effect. Mood can be identified as what others might describe as “The culture of a company” (Macomber and Howell 2003).

People define culture by the way they work. People are driven to do their best not only by empowering them, but also by providing them with a framework and coaching to be successful at their work. If meetings are held and they do not promote work safety, they can be thought of as a waste of time. Yet, meetings should matter.

The principles, methods and tools of Lean construction can help change the course of action. Managing a project as a network of commitments reduces separation between those managing the project and the processes necessary to deliver it (Howell and Macomber 2006). Leaders should encourage conversation to get commitments made and enhance co-ordination and co-operation (Sull and Spinosa 2007). Lean tools promote communication, standardized work and the reduction of waste, all of which help make our working environment and conduct on the sites safer according to the key principles of TPS “respect for people” and “continuous improvement“.

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