Everybody’s Business?
A Qualitative Assessment of Safety Culture at SSAB EMEA

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Abstract

Many modern-day industries share features of tight coupling and high complexity, making it difficult to describe incidents in terms of direct attribution. This situation has been answered by novel theories on the bonds between people and their environment. Cognitive Systems Engineering (CSE) offers a new way of analysing human activities, acknowledging the impact of complex interaction and unpredictability. Doing so allows for innovative ways of pursuing work safety. In this study, the concept of safety culture has been interpreted from a CSE perspective and applied in a qualitative assessment of current safety work of at SSAB EMEA. A total number of 26 SSAB employees were interviewed, probing attitudes, perceptions and safety system structures at the Oxelösund steel mill, rolling mill and upper organizational layers. Additional data was collected using informers, SSAB documentation and participatory observation. Data was processed using a combination of top-down and bottom-up analytical approaches, creating a qualitative assessment of safety culture from salient themes. Results reveal an advanced state of safety management. However, management’s intentions are inhibited by issues in management presence and communication, management training, worker influence, forms and content of operator training, reporting, feedback, flow of communication and safety-related core assumptions. Revisiting lessons learned within the field of CSE, suggestions are made to possible areas of improvement and future research. These suggestions concern employee involvement in safety work, work identities, forms of training, manager roles and communication.
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Introduction

Making steel is in many ways a violent process, involving massive machinery and work materials of extreme dimensions and temperatures. A truthful picture is drawn by Perrow (1984) describing steel mills as tightly coupled, fast-paced systems where disturbances may spread between its different parts, sometimes with disastrous consequences. Work safety in this environment is a matter of life and death, but it is also an exciting challenge.

SSAB is the greatest Nordic manufacturer of crude steel, a corporation spanning operations at four continents. Here, safety has been a living issue for an extended period of time. Several innovative safety initiatives have produced a steady decline in Lost-Time Injury rates (LTI). This trend held until the year 2008, when statistics began flattening out. The organization reacted with a shift in safety work. Where prior initiatives had been focused on technical safety measures and protective equipment, management now identified “Behaviours and Attitudes” as the remaining hurdle before reaching the goal of “Zero Tolerance” against work related accidents. This concept still dominates the company’s safety discourse.

Safety culture emerged as an analytical concept in the 1980’s, following the Chernobyl disaster and its association with negative traits in organizational culture (Cooper 2000). The last 25 years have seen a strong development of its conceptual base. While early theories focused on behavioural manipulation and attitude change, later research has transformed safety culture into an analytical concept also covering the relation between context and individual perceptions. This mirrors a general shift within the safety research domain, going from linear accident models and technological bias to systems complexity and cognitive science (Hollnagel, Woods & Leveson, 2006). With particular relevance to this study, it has been shown that work to improve safety culture may be crucial for organizations where accident rates have reached a plateau, despite advanced technical safety measures (Reason, 2000).

This study covers two facilities at the Oxelösund compound, the steel mill and the rolling mill, as well as upper management layers. It has been carried out using qualitative methods in the form of interviews, participatory observation and qualitative analysis. In the report, a literature review will be followed by a top-down and bottom-up analysis of collected data, leading to a discussion of central themes which is summarized into a qualitative assessment of SSAB safety culture. The title of this study reflects a prominent theme in the following report. Is safety work at SSAB perceived to include everybody, making safety everybody’s business? Is it the will of SSAB management to involve all employees in safety work? If so, then how is that achieved? And is there a balance-act between production and safety, between the business interest of upper management and the business of sharp-end operations? These questions will later be revisited, in an attempt to fuse the seemingly conflicting concepts of technical and psychological factors behind safety.
Background

How can safety be defined, let alone achieved? Answering these questions has engaged the research community for several decades, starting off from a strict focus on technological factors, arriving in cognitive and organizational perspectives on work. According to Rollenhagen (2010), thinking of safety merely as the absence of accidents is not enough. It is by the presence of various safety measures that we regularly define the concept, a notion which recognizes that safety emerges from the interaction between people and their environment. Other researchers have stressed the fact that safety is often a matter of trade-offs. For example, Reason (2000) defines safety as “The ability of individuals or organisations to deal with risks and hazards so as to avoid damage or losses and yet still achieve their goals”. Applied to real world operations these words suggest that factors such as productivity, environmental concern, legal concerns and safety may sometimes compete. This increased focus on the context of work follows the development of cognitive science as a general field of research. In the same way that our understanding of human cognition has evolved with the introduction of contextual models, so has the concept of safety. The following sections will explore this observation. Starting in early development of cognitive science, research will be followed through the emergence of the Human Factors concept, arriving in safety culture and its contemporary interpretations.

Cognition and context

Early attempts of describing human cognition coincided with the massive breakthrough of computer technology in science. Computers lent themselves to advanced problem solving (albeit within strict boundaries), and it seemed natural to equate this with human cognitive functioning. Consequently, the dominating model of human thinking became that of the Homo Economicus (Simon, 1955), a rational individual who solves problems by iterating over all possible actions, comparing their estimated outcomes by statistical means. Newell and Simon (1972) eventually introduced the computer metaphor for human thinking. Here, human cognition was compared to the configuration of a typical computer, including a long term store, a processor and means of input and output. Interaction with the outside world was conceived as a feedback process where information was collected, combined with stored data, subjected to logical functions and transformed into output. In this process the modelled human functioned alone. Cognition was a process taking place in isolation, both from a person’s peers and from other contextual factors.

Some decades passed before the computer metaphor for human thinking was seriously challenged. Computers were developing at an ever accelerating speed, conquering new domains in every progression. The thought that these machines would one day equal or best our own intellectual faculties did not seem too far-fetched, although the premises for that conception was disputed (e.g. by Searle, 1980). In the 1980’s and 90’s however, researchers began discussing properties of human cognition that could not be explained by earlier computer based cognitive models. Human thinking, it was argued, is not a classically rational process taking place in isolation (Hutchins, 1995). Computers are not affective and do not possess our ability to work with incomplete information. In the real world there is no time for
rational iteration over sets of possible actions. Instead, decision making may be more truthfully conceptualized as an instinctive recognition of typical problem features, a form of recognition primed decision making (Klein & Calderwood, 1991).

While cognition has formerly been described as a process in the mind, researchers such as Hollan, Hutchins and Kirsh (2000) now argue for a theory of “Cognition in the wild”. They hold that human thinking is deeply influenced by our interaction with other persons, by culture, and by a myriad of contextual factors specific for each situation. Not only do we make use of feedback information when interacting with the world. We also function in a feed-forward manner, using our creativity and inferences to affect the world and create our own feedback. In fact, Norman (1993) argues that we cannot reasonably regard our cognition as separate from our environment. For us humans, our tools are inseparable from our intellectual functions. Cognitive artifacts (the term used for objects or structures that take part in cognition) are everywhere, amplifying our abilities and extending our thinking. Activities such as workplace design depend heavily on the understanding of how artifacts can support people’s cognitive functions. During problem solving we employ cognitive offload in the form of cooperation and environmental configuration, from sharing information, to writing, to many forms of the well-known knot around the finger (Kirsh, 1995). Cognition, thus, is distributed.

At the time, these new ideas about human intellectual functioning mirrored a general call within the research community for increased ecological validity. Experiments in a laboratory environment allow for strict control of variables and a high degree of reproducibility. On the other hand, the product of such research is often difficult to translate to real-world situations, where the context of operations may change dynamically. Qualitative rather than quantitative methods may often be better suited when studying human activities in natural environments. Describing cognition through experimental, statistical methods could be argued to reflect the older, rational model, whereas methods tuned for ecological validity (participatory observation, interviews etc.) reflect a more context-centred perspective.

From cognition to safety

The idea of context dependent cognition soon influenced theories on human collaboration. For example, proponents of Cognitive Systems Engineering (Hollnagel & Woods, 2005) emphasize the importance of interaction within and outside an organization. To understand work in complex systems, the interplay between people and technology has to be explored at many levels. Not only do we have to examine the interaction between individual operators and their work tools. Many important system functions and features may reside in the interaction within work teams, between teams, between organizational hierarchical layers and between the organization and outside actors. System events take place under the influx of ever changing workload, resources, manpower, environmental factors and interaction both within and outside of the organization. Unexpected system functions and features may appear when its operators creatively adapt to their environment. This means that analysts cannot only concentrate on what happens at the sharp end (i.e. the work floor) of the system. Behind every person’s actions there is a complex of influencing factors stemming from contextual adaptation, cognitive load, culture, design or management decisions, that is, the system’s
blunt end (Reason, 1990). These are factors whose importance only emerges when applying a systems perspective on organizational processes.

Before the appearance of cognitive science as applied to the work domain, safety measures were largely directed at technological solutions, a tendency that to some extent still can be seen today (Hollnagel & Woods, 2005). Research within the growing area of human centred safety work in many ways replicated the development within the more general cognitive science domain. Because early models of cognition were directed toward individual intellectual processes, it was natural for risk and accident models to also apply an individual perspective. This meant focusing on individual mistakes in work processes, a phenomenon referred to as “human error” (Hollnagel, Woods & Leveson, 2006). Incident analyses typically took the form of neatly sequential models of adverse events. In event sequence diagrams, single technical or human failures were commonly attributed as “root causes” (Leveson, 2004). Accidents within high risk environments, such as aviation or healthcare, often had severe personal consequences for the actors involved. Individual operators were sacked and new ones hired, who soon repeated the same “errors” in an unchanged work environment. Critics of the concept of “human error” (e.g. Reason, 1997; Dekker, 2005) have argued that this type of reasoning attacks the symptoms of a flawed system, concentrating too much on surface phenomena. Instead, more efforts should go into discerning contextual factors, both physically present and organizational. Apart from analysing the immediate context of an incident, investigators should also give consideration to organizational structures, lacking communication, policies, training, managerial attitudes and influence from institutions outside the organization. It is easy to become affected by hindsight bias, stressing what seemingly correct actions should have been performed in an adverse situation. However, defining perfect actions presupposes a perfectly predictable world, which is obviously an unrealistic concept. Brown, Willis and Prussa (2000) note that it is a natural tendency for humans to blame other individuals when unfortunate events occur. Besides its lack of analytical depth, “human error” reasoning may also have other negative side-effects. One common example is that it makes employees unwilling to report safety hazards in fear of personal consequences (Dekker, 2007).

**Systems and complexity**

In contrast to risk models centred on the individual, modern cognitive theory applies a systems view on safety. Because of technological development over the last decades, organizations have been growing increasingly complex. Numerous processes may be active simultaneously and as noted above, these processes are affected by a broad range of contextual factors. This means that predictability may be inhibited at times, limiting the impact of safety measures such as policies, regulations, procedures and best practices. Perrow (1984) noted this at an early stage. In his words, technical systems were becoming so complex and tightly coupled that accidents could simply not be avoided. System failures have been connected to several major incidents, ranging from space exploration to chemical plants (Leveson, 2004). It is impossible to define all possible incident states within a complex system, which means that there is a limit to the value of procedures and physical barriers. Consequently, something else has to fill the gaps (Hollnagel, Woods & Leveson, 2006).
“Human error” reasoning has permeated the industry and improving safety has often been a question of limiting the freedom of human operators. Hollnagel and Woods (2005) object to this practice. According to them, events in a complex system are inherently hard to predict. This means that human ingenuity and creativity plays a large role in maintaining system stability. It is people who hold the requisite flexibility to cope with a dynamically changing environment (Hollnagel, Woods & Leveson, 2006). Hence, people at workplaces should be empowered to adapt when circumstances change. Trade-offs between competing goals (productive, safety related, environmental) are always present in real-world operations, and time is always limited. This means that strict compliance may often be a very theoretical concept. According to Hollnagel and Woods, understanding these trade-offs and discussing their implications is vital when analysing workplace safety.

Another factor affecting predictability is delays in feedback on operator actions within the system. Such delays may make it hard to evaluate the system state, and countermeasures during an adverse event may not be effective. Moreover, some organizations have very few albeit serious incidents. This in turn may reduce the opportunities of learning from experience. Ironically, the problem of delayed feedback also applies to the evaluation of systemic safety measures (Goh, Brown & Spickett, 2010). The benefits of new technological implementations are often obvious and direct. Because of system complexity however, positive effects of “soft” measures such as training, reporting or workshops may be hard to gauge.

**Human Factors**

Human Factors has become an umbrella term for research centring on human cognitive traits in relation to safety. Although the concept incorporates modern insights from cognitive science, it was at first, to some extent, related to “human error” reasoning. The premise for early human factors work was that the development of technological safety measures had come to a stage of extremely high reliability. Now efforts had to be directed toward the perceived remaining weak link of complex systems, namely people (Reason, 1990). This line of thinking can still be seen in research that promotes behavioural change as a means of improving safety, playing down the context of cognition and instead focusing on its product. Many researchers have however adapted a systems view on safety. According to them, broader systems solutions should be preferred before measures directed at the symptoms of system deficits (Goh, Brown & Spickett, 2010). Rollenhagen (2010) also makes this observation, pointing to an increasing interest in the interaction between complex systems components. According to these researchers, instead of concentrating on isolated problems, system constituents must be made to function together, with safety emerging as a systemic quality. As noted above, every sharp end has its blunt end (Reason, 1990). Even though some person may be standing closest to an incident location, that does not necessarily hint to his or her part in the event. Contributing causes must be sought on several axes, both in time and hierarchically.

In relation to complexity, Hollnagel and Woods (2005) discuss system boundaries. Human factors activities have traditionally focused on the interaction between individual operators and their work tools. However, an operator’s task may be argued to take place in
relation to several systems of increasing size. Locally, issues may reside in within-team interaction and collaboration around cognitive artifacts. Going further, the interaction between work teams and between layers within an organization can have an impact on safety. At the systems extreme, work may be affected by input from other organizations, legal instances and control instances. This range from individual to society has to be considered if the concept of safety is to be thoroughly penetrated.

Technological safety measures will naturally remain an important feature of modern industrial safety. But if a strict focus on individual errors and technological malfunctions invites simplistic risk analysis, then how can technological efforts be balanced? As mentioned earlier, many industries have few chances to learn from experience. Technological safety measures are highly developed and the number of incidents has often been greatly reduced, although the implications of remaining incidents are still severe (Nævestad, 2010). In other industries incidents are quite common, but handling each adverse event with an isolated remedy is deemed inefficient (Leveson, 2004). Reactive methods, i.e. reacting with safety interventions after an incident has occurred, carry with them the disadvantages of hindsight bias and narrow focus. This insight has been seen in many industries during the last ten years (Flin, Mearns, O'Connor & Bryden, 2000), where reactive methods have given way to pro-active measures. Working pro-actively means rigging the game of safety in order to increase the chances of positive outcomes, instead of treating every incident as a unique event. Through functions such as training activities, workplace design, improvement of communication, reporting structures and increased workplace democracy, a system can be made more resilient in the face of disturbances (Hollnagel, Woods & Leveson, 2006). If this is achieved, an organization that experiences pressing circumstances should be able to adapt. After a crisis has been averted it may return to its normal state, much like a piece of flexible steel. Instead of limiting operator freedom through strict regulations and automation, giving them more influence and better means of controlling the process will equip them with the requisite variety to adapt under pressure (Hollnagel & Woods, 2005).

A common worry is that an increased focus on safety will result in reduced productivity. However, studies have shown that there is no necessary trade-off relation between these two factors. For example, Vredenburgh (2002) examined what factors in safety programs were the most effective in reducing injuries. It was found that pro-active measures resulted in financial benefits through reduced lost time and worker compensation, something that well balanced time and money spent on safety increasing activities. Similarly, Kines, Andersen, Spangenberg, Mikkelsen, Dyreborg and Zohar (2010) examined leader-based on-site verbal safety communication in the construction industry. Here it was found that increasing safety topics in the daily discourse did not happen at the expense of production topics. Instead the two seemed to supplement each other, for example by advancing the subject of production quality.

One way of both assessing and developing safety in a pro-active fashion may be through the concept of safety culture. As stated by Antonsen (2009), the cultural perspective seems to signify a shift away from a rationalistic viewpoint on organizational life. Safety hazards do not only pose a direct threat to the health of employees. They also influence employee perceptions of how safety is managed within the organization, which in turn may affect behaviour (Brown, Willis & Prussia, 2000). Although some authors conceive of safety
culture as a complement to human factors and technological solutions (e.g. Johnson, 2007), it could well be argued that this concept can cover both areas. In fact, according to a systems view on safety, these two categories of safety related factors are inseparable. In the following sections this claim will be developed further.

**Safety Culture**

In 1986 the Chernobyl nuclear power plant exploded, spreading radioactively contaminated matter over large parts of Europe and Western Russia. Several technical deficits were identified, but the OECD Nuclear Agency report (INSAG 1988) also introduced a new concept in accident analysis. What had happened at the Ukrainian nuclear power plant was to a large part ascribed to certain aspects of safety culture, focusing on managerial pressure and compliance (Cooper, 2000). The definition of this concept, however, has seen many revisions since then.

Talk about safety culture originally sprang out of the great interest for organizational culture during the 1980’s (Cooper, 2000). While the initial purpose of these ideas was to manage or manipulate culture in order to increase corporate performance, such “quick fix” conceptions have received much criticism from the research community (Antonsen, 2009). In later sections this question will be revisited. What can be said is that there is some consensus on the impact of culture on professional activities. As Haukelid (2008) expresses it, culture is necessary for creating order in the world, and all of our thinking and acting is culturally mediated. Several studies have demonstrated the direct relation between safety culture and safety outcomes (e.g. Zohar, 2000; Hoffman & Mark, 2006; Johnson, 2007), where improved safety culture, among other things, has led to reduced lost workdays. Research has also shown that a positive culture increases the feeling of responsibility for safety among actors at all levels. Prussia, Brown and Willis (2003) carried out studies at a steel mill, where safety cultures diverged between different work units. In units where safety culture was deemed poor, workers typically held that managers were responsible for safety and vice versa. On the other hand, where a positive safety culture was found, worker and manager perceptions of safety responsibility converged. Because mental models of risks and incidents were shared across organizational layers, learning from experience was facilitated.

Haukelid’s review of safety work within the Norwegian oil industry (2008) provides an informative timeline of occupational safety development. Operations in the early 1980’s were associated with very high accident rates, a harsh blame culture and safety measures with a strict technological focus. The 1990’s saw several pushes for managerial commitment and employee participation, leading up to the eventual development of new cultural traits within the organization after the year 2000. Another paper which hints to the impact of safety culture describes a study made under very special circumstances (Spangenberg, Baarts, Dyreborg, Jensen, Kines & Mikkelsen, 2003). During the construction of the Öresund Bridge, Swedish and Danish teams worked side by side in Danish cement factories, managed by Danish supervisors, utilizing the same procedures for reporting injuries. Despite this, LTI rates (the number of lost-time injuries per million working hours) of Danish workers were nearly four times higher than for their Swedish counterparts. This was attributed to differences in education, experience, training and learning, resulting in differing attitudes to safety related
issues. With particular relevance to the present study, Reason (2000) suggests that working with safety culture may be crucial for organizations where accident rates have reached a plateau, despite continued technological/physical safety efforts.

A common definition of Safety Culture is “The product of individual and group values, attitudes, competencies and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organization’s health and safety programmes” (Halligan & Zecevic, 2011). While this definition covers several facets of culture, there has been a certain bias in research toward concentrating on shared perceptions, values and beliefs (Cooper, 2000). What is lost in doing so is the connection between psychological and contextual factors. This theme will be revisited later. As Haukelid (2008) points out, safety culture guides people’s actions in relation to risks and accidents, but culture is at the same time shaped by actions at all organizational levels. A more penetrable definition may be that of Richter and Koch (2004), who “define safety culture as the shared and learned meanings, experiences and interpretations of work and safety – expressed partially symbolically – which guide peoples’ actions toward risks, accidents and prevention. Safety culture is shaped by people in the structures and social relations within and outside the organization”. In selecting their actions, people are guided by the culture in which they are also active agents. This applies both to people working at the floor and to management’s safety related decisions, which means that the study of safety culture must have a broad approach. As Cooper (2000) stresses, culture may manifest itself in many different forms. Moreover, culture is not a stable entity. It is a living construct continuously reproduced and reshaped by many involved actors (Haukelid, 2008). Furthermore, temporary circumstances may also have less profound effects on culture. This has led researchers to introduce the related concept of safety climate. While safety culture is relatively stable over long periods of time, contextual factors give rise to transient but salient cultural features. Safety climate could be seen as the outcome of safety culture and researchers should make their best efforts to reach beyond such surface phenomena, even though they might also be informative (Luria & Rafaeli, 2008).

The definitions of safety culture referenced above show that researchers have quite differing conceptions about the origin, extent and impact of cultural features. If safety culture is such an elusive part of organizations, then how can researchers claim to observe it? As mentioned before, Cooper (2000) criticizes safety culture research efforts where only people’s beliefs, understandings, attitudes etc. are reviewed. According to him, no understanding of culture can be reached before psychological, behavioural and situational factors have been assessed. In order to reach beyond the study of safety climate, individual features (psychological - attitudes etc.) have to be compared to how work is actually carried out (behavioural features). Moreover, culture is also manifested in organizational structures, covering everything from policies and other documentation, regulations, training programs, means of communication, the physical working environment and so on (situational features). This reasoning is in line with modern cognitive science, where the study of human activities is believed to depend heavily on our understanding of contextual factors and artifacts, manifestations of cognition (Norman, 1993). Rollenhagen (2010) backs this notion, pointing to the reciprocal relation between technology and safety perceptions. Different facets of safety culture can also be seen in other conceptualizations, for example the one of Guldenmund’s three layers (2007) of core basic assumptions, espoused values and artifacts. Some research
has drawn on the idea of a physically manifested culture, for example Luria and Rafeli’s study (2008) on how safety culture may be gauged from employee interpretations of safety signs. Psychological, behavioural and situational factors interact, so that no understanding of safety culture can be reached without approaching the subject holistically. Some common methods of making safety culture audits, for example by the sole use of questionnaires, may therefore be flawed. Of course, this insight must also carry over into attempts of improving safety culture. Much as safety culture cannot simply be assessed through individual attitudes and perceptions, safety culture can neither be improved through behavioural, attitudinal nor contextual changes alone (Cooper, 2000). In addition to this, Cooper also notes that an organization’s safety culture seldom is homogeneous. Cultural variations may be seen between different hierarchical levels, work units and work sites. Sometimes such sub-cultures may even take the form of workforce countercultures (Haukelid, 2008), for example to balance strong production pressures. The understanding of sub-cultures may give valuable insights to what factors are affecting safety culture and give hints to the distribution of power within the organization (Antonsen, 2009).

Taking off from Cooper’s three-pronged model of safety culture, how then should a method to study this organizational feature be configured? Psychological factors such as beliefs and attitudes have received the most attention in previous studies, and because of that several tools are available. Typically, this safety culture facet is examined through questionnaires, interviews or workshops, with questions directed at the individual’s safety related perceptions. Assessing safety behaviour during actual work may be carried out through participatory observation, peer observations or self-report measures, perhaps with the aid of checklists. Finally, situational factors should be examined through analysis of an organization’s safety management system, meaning features such as policies, operating procedures, management systems, control systems, communication flows or training programs. These factors may also comprise the physical work environment, its design, heat, light and so on (Cooper, 2000).

In addition to the facets of safety culture proposed by Cooper, Guldenmund (2007) expands the concept on another axis. In accordance with Haukelid’s ideas about safety sub-cultures (2008), Guldenmund points out that actors on different levels within the organization assume different, complementary roles in safety work. Furthermore, interaction between these levels may have a great effect on the distribution of safety related perceptions. At the Organizational level, upper management carries out safety management efforts and makes decisions taking the form of policies, strategies, targets and means. These are communicated to the Group level, where it is the task of middle management, team leaders and supervisors to adapt general safety doctrines to circumstances at the sharp end. Finally, safety measures worked out at the Group level are communicated to the Individual level, where they are received by sharp end workers and implemented in relation to the actual work situation. The importance of studying cross-level interaction has been noted earlier, for example by Zohar and Luria (2005). They particularly stress the mediating function of the Group level and hence the importance of supervisors’ safety training, a result also found in other studies (e.g. Flin, Mearns, O’Connor & Bryden, 2000; Gadd & Collins, 2002; Guldenmund, 2007).
Representations of safety culture

It follows from the works of Cooper (2000) and Guldenmund (2007) that several facets of safety culture should be studied, at several levels within the organization. The categories of situational and behavioural factors have already been explored to some extent, but what issues should be pursued in questionnaires, during interviews and in workshops?

There seems to be some consensus over what factors cover the concept (Zohar & Luria, 2005), suggesting that safety culture studies may be applied in a broad range of industries (Van Vuuren, 2000). However, researchers have presented several nomenclatures, possibly connected to conceptual differences. A number of representative studies will be presented in this section. This will eventually lead up to a synthesis to be used in the present assessment.

Above all other factors, researchers connect the issue of Management factors to safety culture outcomes. Management must display a serious interest in safety issues, making the subject a high priority in the form of safety measures, training, policies, and in trade-offs between productive pressures and safety (Fernández-Muñiz, Montes-Peón & Vázquez-Ordás, 2007). Haukelid (2008) particularly stresses the hazards of “double communication”. Employee trust in managerial safety commitment may become seriously undermined if the priority of safety is not clear in relation to work speed, incident reporting and compliance. Haukelid also notes that communicating a devotion to safety issues is very much a question of economical prioritization. For example, down-sizing within the Norwegian oil industry has been connected to discouraging accident statistics. The importance of frequent, levelled contacts between managers and workers was identified early (Zohar, 1980), and such organizational features are often seen as the hallmark of a positive safety culture (Rollenhagen, 2010). O’Toole (2001) approaches the subject in terms of “Employee’s perception of safety leadership”, identifying this as the most significant factor in his study. Vredenburgh (2002) chooses the typical term “Management commitment” and Zohar and Luria (2005) speak of the “status of safety issues” as communicated by employee perceptions of management commitment. The latter carry out an extensive literature survey where the dominating importance of managerial influence is established. Johnson (2007) chooses to stress the moral facet of management attitudes to safety, using the category “caring” which also encompasses between-worker relations. Kines, Andersen, Spangenberg, MikkelSEN, Dyreborg and Zohar (2010) emphasize the impact of work managers in direct contact with the sharp end of operations and establish the category “Immediate supervisor’s general leadership and safety leadership”. Creating a strong climate for the safety work of supervisors is also brought forward by Zohar and Luria (2005). Similarly, the focus on lower management and supervisors can be seen in the research by Wu, Lin and Shiau (2010). They found that the most significant category of impact factors was “Safety informing by operations managers”, together with “Safety caring by employers”. Even though the study by Luria and Rafaeli (2008) was directed toward employee perceptions of safety artifacts, this measure is also tied to the superordinate factor of managerial commitment.

In relation to management’s prioritization of safety, most research mentions Employee Involvement in some form (e.g. O’Toole, 2001; Vredenburgh, 2002; Zohar & Luria, 2005; Kines, Andersen, Spangenberg, MikkelSEN, Dyreborg & Zohar, 2010). This category is
closely connected to issues of democracy. Many organizational features of involvement may be crucial for worker empowerment (Antonsen, 2009) and sometimes mediate the strict professional hierarchies found in some industries (Zohar & Luria, 2005; Larsson, Pousette & Törner, 2008). Collaborative efforts may take several forms, for example weekly safety discussion meetings or workshops, forums where managers may display their commitment to safety. Workers should also be involved in the implementation of new technology and procedures, making use of sharp end knowledge about actual work conditions. Failing to do so may even lead workers to sabotage new safety measures that are deemed unrealistic (Haukelid 2008). Furthermore, democratic efforts at the workplace may give rise to a shared construct of work which spans the organizational hierarchy (Prussia, Brown & Willis, 2003). This may strengthen management’s understanding of the realities of sharp end work, allowing for a better analysis of the potential consequences of high level planning.

Employee involvement naturally creates high demands for an effective Communication Flow within the organization, as noted by Zohar and Luria (2005). However, this does not only have to do with formal events of communication, such as meetings or workshops, but also involves other organizational features. Reason (1997) uses the term “Reporting Culture” to demonstrate the importance both of developed reporting tools and the feedback given to safety related reports. Reporting combined with sincere feedback makes up a golden opportunity for learning about safety. Lacking feedback may on the other hand seriously undermine employee confidence in management’s commitment to safety, and negative feedback to reports in the form of individual blame may be disastrous for safety work (Dekker, 2007). Another form of feedback may also be observed in the form of post-incident response (Zohar & Luria, 2005), and in rewards given for good safety behaviour (Vredenburgh, 2002). The activity of identifying both present and potential safety issues as well as near misses makes safety into a constantly active subject. This may be a crucial part of pro-active safety work and benefits communication across the organizational hierarchy (Hale, Guldenmund, van Loenhout & Oh, 2010).

A category related to the one of employee involvement is Safety Knowledge and Training. O’Toole (2001) uses the concept “Education and Knowledge”, factors that may also apply to educational programs outside of the workplace. Taking off from a systems view on safety, it may be very interesting to study what knowledge of industrial safety workers carry with them from school, to the extent that such professional programs actually exist. For example, the issue of education was stressed in the Öresund Bridge study by Spangenberg, Baarts, Dyreborg, Jensen, Kines and Mikkelsen (2003). Vredenburgh (2002) concentrates on internal workplace safety “Training”. Zohar and Luria (2005) use the categories “Competence Level” and “Safety Knowledge”, while Johnson (2007) stresses leadership behaviour through the concept of “Coaching”. This is to some extent echoed by Kines, Andersen, Spangenberg, Mikkelsen, Dyreborg and Zohar (2010) through the category “Safety Instruction”.

Some researchers mention the importance of Compliance when assessing safety culture. There are, however, several reasons to believe that this category may be covered by others of the categories mentioned, and that the notion of compliance is sometimes misguided. Firstly, whether or not workers comply with procedures and regulations may be highly influenced by how these regulations are perceived. This in turn is a question of the relation between regulations and actual work conditions. Bridging this gap is very much a matter of
management involvement in safety issues and whether democratic structures exist within the organization, as noted in the sections above. Secondly, it has been noted that regulations and procedures can never cover all possible states of a complex system (Hollnagel, Woods & Leveson, 2006). Contextual factors may produce situations where improvisation and trade-offs are necessary, and authorities responsible for updating behavioural norms often lag behind the development of sharp end circumstances. Work in the real world is often a question of making on-the-fly trade-off decisions, adapting quickly to context (Hollnagel & Woods, 2005). Strict adherence to regulations requires a world that is fully predictable.

Thirdly, contextual factors taxing the cognition of sharp-end operators may also make it hard to realize that a situation has emerged where a particular regulation or procedure should be applied. Procedures and regulations are cultural artifacts which provide stability and are powerful communicators of management’s safety conceptions (Rollenhagen, 2010). Because of this, however, compliance may also depend on whether regulations convey a sound management understanding of day-to-day operations. When studying compliance, it is likely most useful to direct attention toward the regulations themselves, and the underlying reasons for not following them.

A number of additional categories may be found in the literature. Vredenburgh (2002) makes an interesting case for the importance of safety focus during “employee selection”, i.e. hiring. The work interview is often an employee’s first personal contact with an organization, and safety related attitudes conveyed there may be taken as a hint to management’s commitment. In Vredenburgh’s study on hospital safety work, a strong safety focus during hiring and training was found to have a great impact on safety outcomes. Finally, Wu, Lin and Shiau (2010) observed that enterprises with a positive safety culture, apart from developing training initiatives and showing high management involvement, also employed safety professionals to coordinate and regulate safety work.

**Critics of the concept**

It has been hinted in previous sections that the concept of safety culture is not without its controversies. Cooper has made many contributions to the exploration of the subject, but he also represents a group of researchers who talk freely about the “creation” and “enhancement” of safety culture (Cooper, 2000). This is a perspective on the subject that has recently been contested by several other researchers. Cooper, says Haukelid (2008), has a functionalist approach, a type of criticism that has also been directed toward Reason (Nævestad, 2010). Haukelid states that it may be quite possible to quickly change culture on a linguistic level (i.e. superficially, the way people talk about safety), but that culture is deeply rooted in both conceptions and artifacts which are much more resilient to change. The “management” of culture is, according to this researcher, a faulty concept derived from the very early years of management theory.

It should be said to Cooper’s defence that he primarily proposes the manipulation of organizational characteristics (which could be interpreted as organizational safety measures) in order to change safety culture, rather than some type of direct behavioural manipulation. He is well aware that culture both affects and is affected by non-safety-related operational processes and systems (Cooper, 2000). Researchers like Haukelid and Nævestad argue that
organizational efforts to promote safety have to be deeply rooted in the workforce. Safety culture cannot be created or enforced; in fact it may not even be possible to discern it from other organizational cultural traits (Antonsen, 2009). Culture is created during daily work, in practices and conversations between workers, as well as between workers and managers. If management’s view on safety is to have an impact it has to be present in this discourse (Antonsen, 2009; Nævestad 2010), something that goes hand in hand with the research on management safety commitment referenced above. Rollenhagen (2010) sees a growing bias within the research community to concentrate on the individual’s representation of safety culture, her beliefs, morals, values, attitudes and behaviour. As Cooper (2000) himself notes, culture must be studied as an organizational feature distributed over individual perceptions, behaviours and environmental features, where the environment also encompasses influences from outside of the organization (Guldenmund, 2007). Behaviours and perceptions are rooted in context and cannot be altered directly with satisfying results. If a positive safety culture is to be promoted, the most natural method should be to attempt the creation of an optimal growth environment. Rollenhagen (2010) uses the term design to cover many such measures, both pertaining to the physical working environment and organizational features like policies, regulations, activities and so on.

As a concept, safety culture may consequently be understood as those organizational cultural traits that have an impact on safety (Antonsen, 2009), described generally as an “influence of culture on safety” (Rollenhagen, 2010). Safety culture assessment, then, should not be used to guide behavioural modification programs. Rather, it should be used to uncover those weak points in the organizational environment that have the largest impact on cultural traits, and thus on safety (Stave & Törner, 2007). Conceptions and attitudes may very well affect behaviour and consequently safety, but it may be more productive to think of them as signifiers of deeper organizational traits. While a safety culture cannot be engineered, an assessment of it may guide safety enhancing efforts. In turn, these efforts may eventually give safety culture a direction.

Making improvements

When an organization sets out to improve safety culture, areas of strength and weakness should be identified (Mearns, Whitaker & Flin, 2001). Antonsen (2009) and Rollenhagen (2010) oppose a top-down approach of attitudinal change, instead concentrating on the organizational structures that produce and reproduce cultural traits. Many common risk or incident measures are reactive, only attacking the symptoms of incidents (Goh, Brown & Spickett, 2010). Instead, work has to be pro-active and long term. Nævestad (2010) reviewed a number of safety culture improvement programs and drew the conclusion that positive outcomes of new organizational safety structures depend heavily on a clear management presence. Management must participate actively in order to make safety measures meaningful for the workforce. Hale, Guldenmund, van Loenhout and Oh (2010) carried out studies on factors behind positive safety culture development, visiting a steel mill among other workplaces. They found that all measures promoting a constructive dialogue between shop-floor and line management were effective, and that the empowerment and training of managers and supervisors was key to success. Successful organizations also had well-
functioning systems for risk and incident reporting, using a number of tools (e.g. report forms but also digital cameras) to aid in participation. By contrast, Cooper (1998) found that attitudinal campaigns often fail because of lacking support for work floor managers, poor upper management presence and a lack of substantial tools to reach the envisioned goals. Van Vuuren (2000) particularly stresses the impact of near-miss reporting, which may be especially important in organizations with relatively few incidents. In combination with a reporting culture, effective means of feedback have also been stressed by Hale et. al. In their study, many work sites with a positive safety culture development had implemented work cards for making pre-work risk assessments, empowering workers to refuse dangerous jobs if this assessment uncovered safety issues. Many companies also made use of different varieties of e-learning safety programs and required employees to use them on a weekly basis. In connection to this, DePasquale and Geller (1999) found that making activities like these mandatory had a positive impact on outcomes.

**A safety culture vision**

As the previous sections have shown, researchers have developed a good understanding of what organizational factors have the greatest impact on safety culture outcomes. From this it can be deduced that an organization likely to develop a positive safety culture should display certain traits.

Such an organization is characterized by relations of mutual trust and by safety related perceptions shared over different hierarchical levels (Halligan & Zecevic, 2011). Traits like these emerge from well-developed training programs, tailored for each professional category, permeated by a modern perspective on industrial safety (Zohar and Luria, 2005). Where tasks of work teams, sections or work places overlap, joint training is carried out to ensure smooth cooperation. Training is also carried out when new technology, work tasks or procedures are implemented, or when changes are made. Furthermore, activities are designed to match sharp-end needs and the realities of day-to-day operations (Vredenburgh, 2001). When operators return to work after training, structures exist that connect training to everyday situations. A wide-spread and rich safety competence makes it possible for both sharp-end operators and office staff to reflect on safety matters during the workday.

Commitment to safety starts at the point of recruitment (Vredenburgh, 2002) and includes employees on all levels. In particular, managers manifest such a commitment by making it clear that the ultimate responsibility for safety lies with them (Prussia, Brown and Willis, 2003). More concretely, safety investments are prioritized, managers have a clear presence in day-to-day operations, and consistently communicate a prioritization of safety. This should also be visible in trade-off situations between safety and productivity, and there should be no signs of double standards (Fernández-Muñiz, Montes-Peón & Vázquez-Ordás, 2007). Managers at the work floor level take an active part in safety work (Kines, Andersen, Spangenberg, Mikkelsen, Dyreborg & Zohar, 2010). Safety management stems from a sound understanding of the realities of sharp-end activities, and from an attitude of caring toward the work staff (Johnson, 2007). Incidents and accidents are handled quickly and employees believe in the message that safety comes first.
Every-day safety work sees employees that are actively involved in the implementation of new technology and the design of training, procedures, regulations, work tasks, manning and workday planning. Workers are also given a voice in procurement, and are actively engaged in activities such as risk analyses and other common safety activities (Antonsen, 2009). For these persons, safety is an active topic, and meetings display an open climate for discussion. Employee involvement also makes it more likely that safety initiatives are presented in a meaningful way and are thus appreciated (Nævestad, 2010).

Employees at the same level communicate frequently and productively in safety matters, within work teams and between different teams, sections or workplaces. Experiences in safety matters are shared throughout. The same holds for vertical communication. Here, information does not only flow downhill. A balanced and widespread interaction exists, spanning over hierarchical levels within the organization (Zohar and Luria, 2005). Employees attend open discussions and briefings, and feel safe to engage actively in a sound reporting culture (Reason, 1997). Consistent feedback is given to floor-level staff regarding reports, suggestions, reflections, incidents and accidents, even if no immediate remedy is available (Hale, Guldenmund, van Loenhout & Oh, 2010). This communicative culture also includes sub-contractor workers, maintaining contact at all levels.

Finally, in this organization, the importance of pro-active safety work is thoroughly understood (Rollenhagen, 2010). Many such activities and measures exist, such as different types of risk analysis and revisions when technical or organizational changes are made. The organization carries out safety checks, rounds and near-miss investigations. Recurrent safety training at all levels is rooted in the workforce, safety is part of work planning and design, and employees learn from positive experiences of day-to-day safety operations. All these activities are based on a solid understanding of organizational safety work. Furthermore, they are rooted in the workforce from design, through implementation, to use and revision. A strong and sizeable HSE department makes sure that this process runs smoothly (Wu, Lin & Shiau, 2010). In order to preserve resources, existing activities are developed as far as possible instead of creating new ones. The weights of different activities are calibrated. This is done from the understanding that broad, long-term measures are more effective than attacking isolated problems, behaviours or individuals (Goh, Brown & Spickett, 2010). All activities that may affect safety are uncovered. The same understanding also extends to the area of accident causality and the relation between the organization’s sharp and blunt end. In the face of disturbances, economic difficulties, incidents or crises, the organization displays flexibility and safety does not suffer.

**Subcontracting**

On the work sites of many industries today, subcontracting is a common feature. Professionals may come and go, bringing with them their own work methods, tools and cultures. Circumstances like these naturally affect the discussion of local safety culture, and where subcontracting is found it has to be incorporated into a safety culture assessment. Hasle, Kines and Andersen (2009) observed that smaller contractors may find it hard to implement certain safety measures. The owner is often responsible for a large range of work tasks such as selling, planning, financing, accounting and even manual labour. This means
that safety measures may be a heavy burden, with regard to both time and money spent. Hasle et al. noted that managers of smaller companies are particularly prone to attribute incidents to “unforeseeable circumstances” or individual mistakes. This is particularly interesting in a safety culture context. Other research supports these findings. For example, Sørensen, Hasle and Bach (2007) found a larger acceptance of risks in smaller construction companies, because of the tight interaction between owners and workers.

Subcontracting allows an employer to cover productive peaks or acquire special competence all the while keeping the steady work force to a minimum. On the other hand, mixed-contractor work sites are often associated with problems in communication, complicated distributions of legal responsibility, differing union affiliations and failing safety measures (Mayhew, Quinlan & Ferris, 1997). When working to improve safety culture, subcontracting brings with it certain challenges. As noted above, safety cultures are typically not homogeneous. However, while within-organization traits affecting culture may be manipulated in many ways, the culture of an outside contractor is affected by factors beyond the control of the main contractor. This means that special consideration has to be given to how these operators can be reached and involved in local safety work.
Method

Previous passages on safety culture characteristics give many reasons to argue for a qualitative approach to safety culture studies. Cognition has been established as a distributed phenomenon, where culture may give important clues to its configuration. Culture, in turn, stems from work and discourse, and is affected by countless factors both within and outside an organization. Several researchers stress the importance of context understanding in safety culture studies (e.g. Carroll, 1998; Cooper, 2000; Haukelid, 2008; Halligan & Zecevic, 2011) arguing for means of data collection that match the multi-faceted nature of culture. Some good examples exist of studies that have employed qualitative research methods, for example Stave & Törner (2007) and Luria & Rafaeli (2008).

Cooper (2000) promotes a three-pronged approach to safety culture assessment, weighing in individual, behavioural as well as situational factors. Guldenmund (2007) in turn stresses the importance of understanding organizational levels and their impact on cultural traits. The consequence of combining these theories is that an assessment should be made using multiple forms of data collection.

Questionnaires for safety culture assessment purposes may often invite misinterpretation and researcher biases (Carroll, 1998), and when time is short, interviews may provide greater analytical depth. Because of the common existence of sub-cultures, groups of study are often not large enough to average out random influences (Guldenmund, 2007). Following this reasoning, individual perceptions, attitudes, beliefs etc. in the present study were gathered through interviews, involving employees at several hierarchical levels. Some research shows the particular importance of middle-management and supervisors for safety outcomes (e.g. Zohar & Luria, 2005; Guldenmund, 2007), and special care was taken to include such persons.

Suitable categories of questions were distilled from the earlier discussion, in an attempt to cover the most common categories of quantitative assessments found in the literature. These categories are Management Factors, Democracy, Education and Training, Communication. An additional category, Focus of Safety Work, was also created. This was done because the nature of safety measures, for example whether they are lagging or proactive, has been shown to be tightly connected to different theories or models of safety, as described in the Background chapter. The Focus of Safety Work category also included questions to probe perceptions around accident causation. Table 1 describes the contents of each category.

Work in context was, given the opportunity, studied through participatory observation, both at the shop floor and at management safety activities. During observation, the safety categories described in Table 1 served as a framework.

Finally, situational factors were covered by analysis of organizational artifacts such as policies, regulations, procedures, meetings, reporting structures and training, as well as physical safety artifacts at the workplace. To a large extent, the structure of organizational functions was also charted using interviewees as informers. This combination of data collection methods aimed at a triangulation of safety culture (Guldenmund, 2007).
Table 1. Categories of study

<table>
<thead>
<tr>
<th>Category</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management factors</td>
<td>Management commitment, safety conceptions and attitudes, prioritization of safety, trade-offs, worker perceptions about management</td>
</tr>
<tr>
<td>Democracy</td>
<td>Democratic structures, participation in work planning / safety planning / design / procurement etc., worker representation at higher level safety planning</td>
</tr>
<tr>
<td>Communication</td>
<td>Cross-level interaction, horizontal communication flow, team coordination, meeting activities, reporting structures, worker suggestions, feedback</td>
</tr>
<tr>
<td>Education and Training</td>
<td>Worker background, recurring training, focus of training, joint training, types of training, safety events</td>
</tr>
<tr>
<td>Focus of safety work</td>
<td>Perceptions around accident causation, degree of pro-active work (risk analysis, controls, treatment of near-misses, safety rounds, work planning, training, learning from positive experience, design for safety), follow-ups on safety implementations / investigations / reports / suggestions, focus/configuration of existing measures, strength/size of HSE department</td>
</tr>
</tbody>
</table>

A literature review marked the beginning of this study, followed by meetings with SSAB management and an SSAB work environment engineer, where the task and its extent were defined. It was decided to cover both the Oxelösund steel mill and the rolling mill, because SSAB had a special interest in the comparison of the two. The major bulk of data was collected during one week at the Oxelösund facility, including both interviews and on-site observations. Additional interviews with representatives of upper management were carried out later.

Table 2. Distribution of interviewees

<table>
<thead>
<tr>
<th>Steel mill</th>
<th>Rolling mill</th>
<th>Upper Management / other</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 steel mill Workers</td>
<td>6 rolling mill Workers</td>
<td>1 Work Environment Engineer</td>
</tr>
<tr>
<td>2 steel mill Work Managers</td>
<td>2 rolling mill Maintenance Personnel</td>
<td>1 Safety Manager</td>
</tr>
<tr>
<td>1 steel mill Section Manager</td>
<td>2 rolling mill Section Managers</td>
<td>1 Senior Manager Health and Safety</td>
</tr>
<tr>
<td>1 steel mill Senior Manager</td>
<td></td>
<td>1 Acting Head of Business Area</td>
</tr>
</tbody>
</table>

Interview guides were constructed to allow for a semi-structured approach, making it possible to explore emerging themes spontaneously. Different guides were adapted to different sub-groups of employees, because different organizational functions will likely lead to different relations to safety structures and measures. Questions mirrored a qualitative adaptation of common assessment questionnaires, collected from the literature (e.g. Flin, Mearns, O’Connor & Bryden, 2000; O’Toole, 2001; Zohar & Luria, 2005; Parker, Laurie & Hudson, 2006; Johnson, 2007; Wu, Lin & Shiau, 2010). To save space, only two interview guide examples are given (see appendixes 1 and 2, Interview Guide Workers and Interview
Guide Corporate Management respectively), and these are reproduced in their original form, i.e. in Swedish. A total of 26 interviews were performed, as described in table 2. Participants were selected in collaboration with local management, trying to cover both sexes and varying degrees of experience. Participation was voluntary and participants were asked for permission to record the interviews, which took place in seclusion at each workplace. Interviews were carried out in Swedish. SSAB EMEA uses English as a corporate language, and because of that, the company requested this report to be written in English. Although all interview guides were of equal length, the actual length of interviews varied from under 30 minutes to over 100 minutes, depending on the nature of every individual. All data was subsequently transcribed and translated, resulting in a raw material of 243 pages. Translations aimed at communicating the gist of the answers given, hopefully reflecting idiomatic language while still being comprehensible for an English speaking person.

Analysis followed the lines of van Vuuren (2000). An initial taxonomy was created, as described above. This gave direction to an initial, top-down analysis, where data was sorted according to the original categories. After this, data was examined in search for salient themes in the discourse of employees. These, in turn, became new categories of bottom-up analysis. When after several iterations no new analytical categories appeared, data was considered to be fully processed. Categorizing the interview materials unavoidably led to generalizations over the answers given by different groups of employees. Because upper management representatives have such a strong influence in the organization, an answer given by only one of these persons was still considered to have considerable weight in the discourse.

At the end the material consisted of sections referring to themes that had proven salient, gathered both from original categories and the material itself. Analysis was followed by discussion of these themes, the results of which make up the actual assessment of safety culture at the studied section of SSAB EMEA.
The major aim of this study was to assess safety culture at SSAB, as reflected by two facilities and upper managerial layers. Additional questions concentrated on possible development, methodology and the concept of safety culture itself.

1. Does the assessment hint to any gaps in current SSAB safety work?
2. What may cognitive systems theory add to the study of safety culture?
3. What is the relation between the law of requisite variety and common shared safety measures such as regulations and procedures?
4. How does the use of qualitative research methods in this assessment affect the study of safety culture?
Analysis

This chapter has been generated through both top-down and bottom-up analytical approaches (van Vuuren, 2000), where themes have been gathered both from the theoretical background and from the interview material itself. If no important differences exist between interview groups for a particular theme, results will be reproduced together. When interesting differences appear between organizational levels or instances, this will be accentuated. Citations from different individuals will, when reproduced consecutively, be separated by ten dots in sequence. When clarifications are needed these will be inserted inside citations, surrounded by brackets.

Management factors

Over the last few years, SSAB has undergone an extensive organizational revision. New upper management positions have been created and profound managerial changes have also been seen locally. According to a majority of all interviewees, these changes have gone hand in hand with an increased focus on safety matters. At the policy level, safety has truly been made a company priority. Locally, one representative of steel mill management states, safety is part of all operations or implementations, from beginning to end. While some of the new manager positions are not directly safety oriented, it has also been natural to emphasize the safety work impact of all upper management representatives. For that reason, even a senior manager primarily responsible for the business area of SSAB EMEA can be interviewed in a safety context. The message of upper management is expressed clearly.

IP: If we’re serious about employees being our greatest resource, we have to make sure that they can come home the same way that they arrived here. And that’s our main... That we care, that is our foremost…

SB: Your core message?

IP: Yes, yes. ‘We care’, simply, that’s what it’s about. Then on top of that, of course there are side effects. It’s naturally better to have healthy, safe employees than to have people who get hurt. We become a more attractive company for people to come and work for, and stay with. You get a better… How shall I put it? There’s more goodwill around a company which has a safe work environment than around one that constantly figures in the press, with accidents.

According to the same manager, developing safety work has been understood as a slow process.

IP: This isn’t something you can simply buy, you have to work for it. But there are good ideas, there are thoughts, there is also… Maybe you can learn something from the patience, if you look at others who have come far, which I also believe is important. So that you don’t rush it or carry out this work in a way so that people… I mean, you can’t command safety you know. You have to find a way to integrate it in the right way.

If this managerial attitude is to have an effect, however, one senior manager believes that it must be firmly rooted among the members of management.
IP: And again, in my role and for us who hold leading positions, we have to be role models, we can’t be careless about this. It mustn’t just be lip service, we really have to believe in it. We have to believe that it’s possible to work completely safely. We can’t go around thinking that ‘Yes but we will have ten accidents, because that’s something statistical’. We have to dare to believe that it is possible to approach Vision Zero.

**Commitment to safety**

When upper management interviewees are asked how they themselves can show a commitment to safety, all answer in terms of caring and presence. Other statements also imply that winning the hearts and minds of employees is very much a question of management attitudes and communications.

IP: And of course, if I frequently, not me personally but my role and the work we do, work to see that it’s available frequently on the intranet, that it’s communicated, that it’s put out there, then that in itself will increase safety awareness.

One way of displaying such a commitment, according to managers, is through taking a hard line when implementing broad safety initiatives. Recent, prominent examples of such activities are the Zero Tolerance campaign and the campaign for mandatory use of protection glasses. Even though some manager comments suggest that the goal of Zero Tolerance is impossible to reach, it is still argued that this vision sends a clear message. It is also important to communicate that safety is allowed to cost money, as stated by a representative of corporate upper management.

IP: Lots of communication, and very much that managers, in the ranks below us so to speak, believe in what we say. That they don’t scrap investments at their own initiative because they believe that we won’t accept them. […] You should never be able to measure [safety] in money, investments that are about the safety of our employees out here, we have to be able to see those through.

Even though it is hard for senior managers to find the time to visit the work floor, all have a clear ambition to do this regularly. When this happens, several persons mention the importance of leading by example, e.g. making sure to use their own safety equipment. For example, these are qualities hinted in a description of the steel mill manager.

IP: He talks a lot, he measures a lot, he gets down to the details of what we need to get a safe… He helps us section managers to go out and… He’s committed, he’s there and he talks about it a lot.

Similar views are held by section managers. Once on the floor, showing a presence means enforcing the use of protective equipment and reminding workers about safe behaviour.

IP: But then a lot has to do with me being out there, showing myself and setting a good example. I wear my own protective gear and my eye protection, all of it. When they’re doing heavy work I tell them ‘Mind yourselves, keep the distance, don’t stand to close, don’t forget Break and Lock.’.

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IP: It’s a bit of police work really. But then you also have to be open, if people want other types of helmets or shoes, to see what’s out there. To listen, yes… And be ready to spend money on it.
IP: Safety rounds, showing yourself, that you’re out doing your safety rounds. You bring your staff, give them feedback, for example feedback about issues that have been resolved.

This message also has to be communicated to new and temporary employees.

IP: The first thing we tell them is that ‘You don’t have to run, you’re not used to running on cooling beds, the ones who have worked here ten years know where to place their feet’.

The managerial situation of the steel mill is in a way unique, because work managers now constitute the closest authority for operators. If commitment fails in any part, one manager says, it may be here.

IP: I believe it’s considerably worse when it comes to work managers. [...] We have to concentrate on work managers to get anywhere with this, that’s obvious. It doesn’t help that I write something down and think that they’re going to change out there. Instead it’s a daily grind, and controlling that people follow the safety regulations that exist. Because that’s also lacking. People even cheat with a simple thing like wearing you protective glasses, and other safety gear as well. And that’s why you get burnt, to a large extent, because you don’t use your personal safety equipment.

At the rolling mill, section managers also talk about possible commitment issues. On the one hand there has lately been a focus on safety drills, and incidents and accidents are regularly brought up by upper management at weekly and monthly meetings. Management is willing to discuss safety matters, but is seldom seen at the work floor and is often hard to reach, presumably because of other obligations. It has also proven difficult to source enough money and time for training of certain key employees in production. One section manager notes that upper management mainly communicates with the workforce through the Intranet, but that many workers do not use that resource to any larger extent.

One person from local upper management states that management commitment to safety is widespread and profound, a conception that seems to be common among his peers. Now, he says, this commitment simply has to be transferred to the work force, but how to do that remains something of a mystery to the management group. While sharp-end operators appear to have registered management’s outspoken focus on safety, he says, they do not quite seem to believe in it.

Impressions of commitment

Interviewees at many levels within the organization agree on what factors lay behind the marked push in safety work. Accidents cost money and disrupt the production process. Here, a rolling mill worker states what appears to be a common notion.

SB: Why do you think there has been a push?

IP: People who are at home cost money.

SB: They have realized that?

IP: Yes, and it doesn’t look very good if you have a lot of accidents at the workplace.
Furthermore, a manager says, Oxelösund has received something of a bad reputation over the years, even in comparison to its sister facilities in Sweden. A clear difference can be seen from only five years ago, when upper management started making comparisons to other SSAB facilities.

IP: When it came to joining our operations with Borlänge and Luleå, it became apparent that we had more accidents with absence and so on. It started then, because Oxelösund didn’t want to be worst.

Among managers, a very concrete shift has nevertheless been seen. It has become easier to receive financing for safety related projects, more money is spent on safety equipment, training has been revised and new aspects of safety have emerged. One such example is cleaning, as part of the SSAB One project. Safety issues are put first at meetings for management and there is a clear message about the prioritization of safety.

IP: Yes, there’s an acceptance nowadays. Upper management has never ever come to me and said “That delay was too god damn long!” if it has to do with incidents or accidents. They’ve stopped doing that completely really, we have a totally different acceptance. We’re simply not supposed to have any accidents, you know.

In fact, one section manager says, simply uttering the word “safety” can sometimes bring focus to an issue during management activities.

IP: You have that support, you know. If you say ‘safety’, you’ll get… Even if it’s an investment and you say ‘This is a dangerous task, we need this’… If you make it a safety matter, you will get it.

Upper management echoes this, albeit not in an equally positive way.

IP: And safety… I can tell from the amount of issues I receive from employees, that very much is made into a safety issue. Things you might discuss, ‘Is this…?’ Like parking, is that a matter of safety? Well, so far as cars may be in the way of fire trucks, perhaps handicapped [people] don’t have their spaces and so on, but this becomes... When you want some action, and add a bit of weight to an issue, then perhaps you make it into a safety issue.

The change described above has not only been perceived by managers. All workers interviewed have seen a change in safety work during the time of their employment, something that is generally connected to managerial actions. An increase has been seen in the availability of personal safety equipment, the enforcement of its use and to some extent, through worker involvement in testing and selecting of equipment. One person mentions an increase in the reporting of incidents, and several explain the change with a generational shift, seeing that many young people have recently been recruited.

At the steel mill, several persons feel that the new work managers have made safety a more active topic. Commitment to safety among work managers receive many positive comments, although people find it hard to point out what work manager features signify that safety is prioritized. Some mention that work managers bring up safety matters at meetings, but most think of instances where work managers have pointed out that safety gear is not being used. One person adds that his work manager is active in seeking out new types of
safety equipment, another person describes a positive, open attitude concerning safety matters, and a third mentions open discussions around safety.

At the rolling mill, the perceived safety commitment of section managers varies greatly, in essence splitting the group in two. Positive comments are made about managers who often bring up the use of personal safety equipment, and who are clear about their safety commitment at meetings and in discussions. There are also several positive comments about the frequency of section manager visits on the work floor. On the other hand, two persons do not see their manager very much during work, and several persons have not experienced much manager talk about safety at meetings or during other interactions. One person means that worker-manager interaction tends to deal with production issues rather than safety matters. Differences clearly exist between sections, or between work teams. While some mention that managers are quick to comment on the use of safety equipment, others have never seen this.

SB: Do you get any positive feedback, if you, for example, put safety before production?

IP: No idea really.

SB: Or if you’re strict with your personal safety equipment?

IP: No, nobody keeps track of that.

SB: Nobody does?

IP: No, nobody does, it’s up to you.

When workers are asked about the safety commitment of upper management, attitudes are not equally positive, and no real differences can be seen between the two facilities. Some persons are neutral, simply stating that “At least they try” or that safety work at least is better than before. Upper management is rarely seen at the workplaces and several interviewees find it hard to even answer the question about upper management commitment. Instead, many point to the Intranet as the principle point of contact. On-line communication takes the form of new regulations and safety promoting messages, both of which render few positive remarks. Even though there are some hints about commitment to be gleaned from the Intranet and internal papers, no solid message about safety is perceived. One person touches on this when talking about a recent drive for mandatory use of eye protection.

IP: And then they think they have solved… The important thing is not whether anybody gets hurt. The important thing is that they are no longer responsible.

Another person believes that upper management mainly focuses on production.

IP: I would guess that they look more at numbers. That’s probably more interesting for them. That we are productive.

A person with long experience within the rolling mill has seen some ups and downs in this respect.

SB: But have you seen a push in safety work?
IP: Yes, in times that are good maybe. In times that are not so good you can save some money there [in safety work]. You make other priorities then. When times are bad for the company safety work usually suffers, because there may be need for expensive reconstructions, things like that.

Other comments indicate that there have been pushes in safety training during periods of low activity, for example during the last global financial crisis. Unfortunately, this crisis also meant that many temporary employees had to leave their workplaces and consequently did not take part in training during these months. However, one such person says that upon returning to his job, he noticed a marked positive change in the prioritization of training and education.

Responsibility

Representatives of local upper management all point to themselves or close colleagues when asked about who holds the ultimate responsibility for workplace safety. The same pattern is seen among interviewees from corporate upper management.

IP: And I think it’s very important – and that’s an area where we could be much clearer – that the manager holds responsibility. It’s not some work environment engineer or Occupational Health Services that holds responsibility and should maintain safety. That’s the responsibility of the manager.

Locally, however, one steel mill section manager also wishes to stress the individual responsibility of every employee, stating that “every person is his own safety representative”, but adding that enforcing compliance is the responsibility of work managers. One of his counterparts at the rolling mill also stresses that responsibility has to be shared, and says that she depends heavily on safety representatives for the task.

When workers are asked, some differences appear between the steel mill and the rolling mill. At the steel mill, half the group mentions safety representatives as the go-to persons in safety matters. Several other choose to stress personal responsibility for one’s own safety.

IP: But then we have our own responsibility. We have to check so that everybody uses safety equipment, and uses for example life lines, fall protection and that sort of stuff. So if you see it, you have a responsibility to point it out so that something happens.

.......... IP: But concerning safety, it sort of feels like you have to pay attention to it yourself, and be careful with what you do.

.......... IP: Well, in fact every person on his or her work place should pay attention to this stuff. You’re supposed to use the right clothing when you’re out working with steel.

Scattered remarks are also made around facility owners, the safety coordinator, shift mechanics, the union, work managers and finally the steel work senior manager.
At the rolling mill, only two workers bring up individual responsibility for safety, and the same number mention safety representatives. Half the group thinks of section managers as the persons responsible, and only one mentions upper management of the rolling mill.

**Handling of events**

Managers of both the steel mill and the rolling mill appear to agree on the point of response times for incidents and accidents. Generally, response time for accidents is described as quick. Not so long ago, the rolling mill experienced one such event.

IP: The last thing I had was a fairly large fire down here, a few weeks ago, Easter holiday. And the first person who called me was of course the gateman […] ‘Damn it, there’s been a fire at your section, maybe you’d better go there.’

SB They’ll call you at any time?

IP: Yes, if you’ve got your phone on.

On the other hand, the handling of minor incidents or near-misses is said to be somewhat unstructured. Comments from both groups of interviewed workers seem to confirm this, stating that the speed of response is related to the judged severity of an incident. When grave incidents have occurred, investigations and interventions have started immediately, although there has often been lacking feedback about interventions and the general aftermath. For minor events, incidents or suggestions on the other hand, the process is often much slower.

IP: Sometimes the process is very cumbersome. It takes so much time to… Even if you point it out, it’s a very slow process actually. It’s like something serious has to happen for there to be any interventions. That you’re forced to do it.

According to one worker interviewee, however, this is not entirely true at the steel mill. This person sees a difference in processing speed since the new work managers were appointed, and connects it to improved worker-manager communication.

**Maintaining management presence**

While corporate senior managers are responsible for the safety management of a very large organization (SSAB EMEA including Europe, the Middle East and Africa), they try to visit local facilities at regular intervals. Depending on the role of every individual senior manager, this can mean visits from two times every month, to two or three times every six months. When upper management representatives find time to visit the facilities they are often tied up in directorate meetings and contact with the workforce primarily has to be maintained through Steelnet. However, it is the clear ambition of senior managers to visit the work floor on such occasions. One person sees many benefits in doing so.

IP: We’ve had this, and we will continue this autumn, where we’ve said that we should follow up accidents with absence and serious incidents. And then we’ve come to the work site and we’ve wanted to go out and see this first-hand, at the facility, to be seen at the facility. And I mean, for one thing we get a better understanding of, that, I mean, it’s not always that simple. But also, a large part of it is to send the message to the organization, that ‘We care about this, it’s important to
us’. […] And the focus has been very clear, that we’re not going there to act as police officers in this individual case. We are there to see what measures can be taken so that it doesn’t happen again.

This attitude is echoed by steel mill upper management.

IP: And then, because I spend quite a lot of time out in the organization… I have pretty much chosen ‘Management by walking around’. Maybe not the last month, but earlier… I have my calendar blocked, between eight and ten I’m normally out there. And then you get a lot of personal contact where people can raise those questions.

In addition, weekly news is published on paper, something called the Steel Bulletin. Apart from these attempts, steel mill upper management still relies heavily on on-line channels for communication with the work force. Worker comments seem to reflect this situation, some connecting it to shift work.

SB: Do you meet these managers often?

IP: No, maybe if you work daytime, otherwise not so much.

Others are more explicitly negative.

IP: No, that works pretty bad I think. You never see them, but you could probably reach them over e-mail perhaps. No, I don’t know.

One steel mill operator once contacted a representative of upper management directly, in order to discuss the way women are treated at the workplace. The outcome of this situation seems to have depended very much on the attitude of that individual manager.

IP: And then I e-mailed our CEO, because I didn’t know who to turn to. And I got an answer from him, and I got to attend a meeting together with the staff manager and so on. So you can make yourself heard if you want to.

SB: But you took a bit of a chance? You didn’t know what response you were going to get?

IP: No exactly, and now he’s quit, so that sort of came to nothing as well.

One steel mill reform which mediates this fact, however, is the recent re-appointment of work managers. During a long period work teams had no in-team management, instead electing representatives from their own ranks. The initial removal of work managers was done to strengthen democracy, but according to interviewees, the actual effect was in many ways the direct opposite. When work teams lost their closest manager, the link between workers and management was weakened, in fact eroding democracy instead of reinforcing it. The newly appointed managers have also been selected from the ranks of workers, and they still follow their teams through the shift cycle. Developing a work description for these persons is still an on-going task, but they already grant manager presence close to sharp-end operations.

Contrary to the steel mill, rolling mill work teams have no in-team management, but instead follow what is called a “Group Organization”. Here, a person elected by his or her fellow employees represents the work team at meeting activities. This person is expected to
probe the team about current safety topics and relate this information upwards. Instead of work managers, rolling mill work teams have their closest manager contact in section managers, who are typically responsible for around five work teams, each consisting of around ten operators. This means that communication has to be carried out through different media or through intermediaries.

IP: I think that’s because… We managers are quite few, and where I am manager – as I said, there are 13 men per team, and when they arrive they go directly to their stations. And you don’t go around to each of them, you send an e-mail or bring it up in a weekly memo that we have.

[…] SB: In total you’re manager for about 60 persons?

IP: Yes, 67.

SB: Then it’s hard to maintain a personal contact?

IP: Yes, more than with safety representatives, because I meet them. And the group representatives.

Some comments suggest that this situation creates a negative distance between managers and workers. For example, one section manager retells an episode where cleaning has been inadequate, and remarks that you have to look for new ways of improving these relations.

IP: And then they’ve called the Union, and they’ve said ‘Well talk to [your section manager] then!’. But no, they don’t dare to. They’re afraid of, you know… ‘For god’s sake, you don’t have to be afraid of me!’. But then he’s taken pictures and sent them to my computer, and then I’ve been able to take it from there.

**From vision to implementation**

According to upper management interviewees, when central safety initiatives are implemented, upper management should take an active part and make sure that they are not corrupted. Doing so is to some extent made harder by the fact that central safety management has no real resources of its own. Instead, resources are held by production management for each local facility, and the time and money spent on large-scale initiatives is largely determined here. This means that when a safety activity initiated by senior safety management reaches the work floor, it may have been distorted by trade-offs along the way. Besides, local resources are often strained, as stated by a representative of local upper management.

IP: And then, when we’ve done that, it [the initiative] is supposed to be integrated into our operational plan. But there it might collide with another safety training activity, or a third safety training activity. And that’s when you see that ‘We don’t have time for this’. Then I go to my Work Environment Engineers and say that ‘We are to have a Safety Day now, or a Work Environment Day, and we’re supposed to schedule it for this spring’. Then they say ‘That won’t work. We can’t, because we don’t have enough resources for it’. And then you get… That’s where you get this friction, then.

Corporate upper management, on the other hand, would like to show a larger resolve in these situations.
IP: And in a way you might say that if we make up our minds and act consistently, of course that will have consequences for some people, and it may be uncomfortable and so on, but you fairly quickly get used to that ‘This is the new policy, the new position’. While this insecurity that follows when we make a decision and then backpedal half way, and then we get some kind of half-measure, that has created quite an uncomfortable situation in a large part of the organization, for a rather long time.

Lack of time and resources are problems often mentioned during interviews on all levels. Steel mill work managers, being close to the work process, report a high work load and little room for additional safety tasks. Similar comments are heard from rolling mill section managers.

No comments during worker interviews suggest that the design or implementation of large-scale safety initiatives are discussed with representatives of the actual work places. In the following section, this subject will be revisited in connection to manager conceptions versus work floor realities.

Work floor realities

To further probe the relation between upper management and the work force, operators were asked whether they believe that managers understand the realities of day-to-day operations. Some positive remarks emerge. For example, work managers are believed to have a good understanding of work floor conditions, which seems natural given the fact that they have once themselves been operators. On the rolling mill, section managers are also given some positive remarks in this respect.

Going further up the organizational hierarchy, workers are markedly more sceptical, and several directly negative responses are given. One person does not think that managers listen to worker suggestions, but mainly care about smooth production.

IP: It’s like ‘You are doing a damn god job!’, but they don’t look at ‘How do you work?’.

Similar views are expressed by another person.

IP: People outside the steel mill have no idea of how things work here […] I was at a meeting with management, when they had a briefing about all the incidents around the crane at MS1, and I questioned whether they did not think it could have to do with the fact that we don’t have any breaks when working the crane. But that topic wasn’t prioritized I believe.

A number of concrete examples exist where upper management has enforced safety related initiatives on the work floor. In the first instance, management has established that eye-protection should be used at all times, inspired by the safety work of SSAB facilities in the US. Worker comments about this are largely negative. The following person is hesitant to what the actual point is of this campaign.

IP: I don’t really know why you should use them when you’re walking between places but... You can get dirt in your eye.

SB: It’s a general thing that’s been sent out?

IP: Yes I don’t know. I haven’t really understood this thing, but...
SB: It’s not that well suited for you work?

IP: No, I’m sure it’s… I can imagine that they need them at the steel mill, because there’s a lot of stuff flying around there, there may be spatter or anything you know, wherever you are, but here I don’t feel that… It’s not like I will get something in my eye.

Management does not appear to have sought worker input before implementing this initiative, something that is confirmed by another operator. This person is pessimistic about the chances for worker involvement altogether.

IP: I don’t think that we workers have any say in choosing safety equipment […] I don’t know how that works.

Other persons state that some of their work tasks make glasses hard to use and that wearing them can sometimes introduce other hazards.

IP: But it’s a bit like this, that sometimes you can’t use the safety glasses at all times. Because you work inside a hall, and it’s dark, and you have spotlights in the ceiling, so light diffracts in a weird way against… So a lot of people have tripped when they’re simply walking somewhere. And [during] some tasks that you perform you really have to see, when you’re inspecting the slabs, then you can’t have any diffraction in the glass, because then you’ll easily miss defects in the slabs.

Operators and managers, it appears, rarely meet to discuss issues like these. Instead, management has taken a hard line. One person claims that he has tried to voice these problems, but suspects that issues may get lost in the organizational hierarchy.

IP: I try to tell my manager that I cannot use them all the time, and then she’s supposed to carry it forward, and then it easily gets lost.

Other comments suggest that the hard line of enforcement may be interpreted in terms of a transfer of responsibility.

IP: One or two things are issued centrally that are ridiculous in my opinion.

SB: What may that be?

IP: Well, the glasses are a good example. We have too much eye injuries at SSAB, or… Well. And then the managers have realized that over in the US everybody uses glasses. And then the upper [managers] say that ‘Now everybody should wear safety glasses, because then we’re not responsible anymore’. Instead of looking at ‘Who receives eye injuries and when?’. It happens when people work with things, and they don’t use the correct safety glasses. And then you solve this problem by [saying] that everybody should use safety glasses, a silly thing that.

In some cases, focus on one issue may be seen to divert attention from other important safety issues.

IP: And then… Of course you should use protective glasses, but what about plugs, I mean ear buds or hearing protection? […] Everybody’s supposed to protective one’s eyesight, but you don’t need to hear anything. Many of the older [employees] don’t use plugs or hearing protection. I use both when I carry out my work.
A section manager at the rolling mill appears to take a similar position. Here too, situations have been identified where the hard line of eye-protection is difficult to follow, but upper management has not been sensitive to these issues.

IP: Then they say that it applies to protection clothing as well, protective glasses and all that, but… I don’t really feel that we get… We use protection glasses, yes. We also have a noisy environment. If you put hearing protection on, you will end up with a gap between [the glasses and the hearing protection]. No one really takes us seriously. And it’s brought up on safety representative meetings, and they don’t get anywhere with it.

SB: There’s no understanding of these circumstances?

IP: No, and that’s due to a lack of presence, that they’re not out getting the overall picture, asking questions and getting involved.

The other example is connected to the vision created by upper management of a “Zero Tolerance” to work related injuries. There is little mention of this initiative during interviews, which may suggest that it has not yet been rooted within the work force. One manager, however, feels that this initiative is incomplete.

SB: You don’t give people the tools to fulfil zero tolerance?

IP: No, I do not think so. We lack in that respect, we definitely do.

**Design of management**

Previous sections have shown that managers on all levels are often strained by a high workload. In this context, several members of upper management stress the importance of delegation throughout the organization. According to one interviewee, while managers should clearly manifest their responsibility, they should also be trained to delegate more efficiently. There is a danger of becoming tied up in the minute details of everyday safety.

IP: And the point of my whole management philosophy is that every day work, I mean… Training, resources, competence and authority should be given to the staff, so that they can make decisions. The manager shouldn’t have to act as a sea captain, saying ‘Now we have to do this, now we have to do that’. The staff should have that competence, because the manager should have time to work with strategic issues. Constant improvements and safety. […] You sometimes hear from front line managers that ‘We’ve got so much to do, how are we supposed to have time for this as well?’. But I would say that safety is their main work task. I mean, we should have operators who are capable of maintaining daily operations and how we run the process.

This discussion very much applies to the newly appointed steel mill work managers. Upper management has the ambition to equip these persons with more robust safety management tools, e.g. competence in leading discussions around safety. More and more responsibility for certain safety tasks is also being transferred from management to work teams, in an attempt to improve worker involvement in safety work. Also, if front line managers were trained to delegate more efficiently, safety could take a much higher priority.
IP: It is my personal conviction and experience, that it is unfortunate in the cases where we have chosen not to have a work manager at every shift. And the thing that suffers the most is safety work. And again, I don’t think we should reinstate a manager to run daily production, I think our operators are capable of that. Instead [the manager] should work with constant improvements, and with safety.

The appointment of work managers, however, has not been without its controversies. Both the Union and people within the company have feared the return of a micro-managing local authority.

IP: We also had a conflict with Metall [the Union] when we reinstated work managers, which means that there’s probably some resistance, that people feel monitored and controlled to a higher degree than before.

SB: By work managers?

IP: Yes, that may have had the effect that this dialogue isn’t fully working.

**Safety and productivity**

When talking about management commitment to safety, one very clear theme emerges in interviews at all organizational levels. Both the steel mill and the rolling mill are constantly measured for the amount of steel or plate they produce. In Oxelösund, SSAB is by far the largest employer, and operator comments suggest that even they feel some responsibility for the financial strength of the company. On the other hand, pushing the production pace clearly produces many safety hazards, as reported by all interviewees. It is clear that the balance between safety and productivity has been an active topic within the organization for many years. While negative trade-offs have been common in the past, upper management now tries to communicate the contrary. Despite this, upper management states that sharp-end employees may not have been fully convinced.

IP: I feel that people don’t believe in it. That they think they’ll be blamed for it anyway. And then I don’t know, it’s a really difficult matter. I don’t know if it’s an explanatory model that has become a self-fulfilling prophecy, or if they really don’t believe in it. Because everybody from the highest management here to… Yesterday [on a meeting] I said that safety comes first. And then I asked ‘Is there anybody who does not believe it?’, and nobody raised his hand. ‘Is any of you afraid to bring it up?’ Nobody raised his hand. But the fact is that people don’t believe in it. They think they’ll be blamed for stopping [the process]. That’s what they say.

Another person from upper management shares this notion to some extent. Safety is in a way a non-conflict subject, but sometimes managers fail to see how their own demeanour impacts on safety.

IP: Nobody raises his hand and says ‘I want an unsafe environment’. But then I sometimes think that, even at a high organizational level, this hasn’t really sunken in. It has not become a primary conception that safety is more important than production.

SB: So, it’s about showing it in action?

IP: Yes, exactly. Your rhetoric says it, the things you say, and everybody realizes that it should be that way. But from there, to dare to stop a production line or an important product while referring
to safety, that’s not a given thing. If you have disturbances in production and you know that ‘OK, we could be running in a couple of hours if we take a risk’, then some managers are willing to take that risk. Maybe from the experience that ‘We’ve done it twenty, thirty, forty times, without any problems’.

According to upper management, making sure that such trade-off situations are handled correctly is very much a question of manager safety thinking.

IP: To show it in action. And, as I said, for us who sit at leading positions, you have to be consistent, thinking ‘Safety first!’. When something happens in production, that we don’t put pressure on our employees to do things in an unsafe way, without putting safety…

Apart from these examples, all senior managers talk about the safety-productivity trade-off as a question of operator attitudes. This is typically described in terms of “taking shortcuts”, failing to do risk analyses or not being “risk conscious”. To some extent, management tries to counter this through campaigns, but it is acknowledged that safety-productivity trade-offs are also a matter of on-the-spot interpretation.

IP: [We must] Talk about this with managers and employees. ‘We shouldn’t take unnecessary risks. We should perform risk analyses. We should do it as safely as possible’. I mean, in some work tasks we take a calculated risk, but it has to be a conscious risk, not an unconscious one because we're not aware of it.

Interestingly enough, at the steel mill, upper management answers “No” to the question whether safety is prioritized over production.

IP: As long as I can remember that has been the case. Management here in Oxelösund has talked and talked about safety, but in every situation where there has been a conflict they have prioritized production.

According to this person, trade-off situations are often encountered during day-to-day operations. This has been the reason for making what the manager calls an “inventory of conflicts”, listing possibly problematic situations and attempting to address them. The inventory is meant to be a hands-on approach for improving attitudes around safety work, serving as an alternative to constant talk about safety. It has already generated several ideas for technical revisions, training initiatives. Some situations have also been revealed where worker attitudes or behaviours are believed to be the main contributing factors. One section manager, however, claims to have observed that many of the listed conflicts are really not conflicts at all.

IP: And when we’ve made this list, there are not very many conflicts really. It’s pretty obvious whether we should go on or stop. Many times an operator feels that ‘This is...’. But when you explain that ‘This isn’t dangerous’ or ‘In these cases we have to stop’, then they understand. So it’s very much a question of explaining the different tasks.

Moving closer to the sharp end of operations, a work manager echoes the above comments on day-to-day decision making.

IP: No, I mean it… I would lie if I were to say that it is like that. I don’t feel like doing that. Of course you disregard it sometimes, in certain situations, you do. But that’s the type of things you
think about afterwards, because time is so short in many situations and you have to make a
decision. […] and afterwards you can make an evaluation and say ‘That wasn’t very good.’. That’s
what I mean has happened, of course, that you think afterwards that ‘Maybe we shouldn’t do that
again.’

At the work floor, the following person has clearly grasped the official message from
management, but he also hints to some uncomfortable contrasts.

IP: But we know it, that they think that ”Safety first, then quality, then the size of production per…
our tonnage”, we know that.

SB: And you believe it?

IP: Well, yes but… Sometimes there are incidents – well, not incidents, but sometimes it happens
that safety is not put first, and that becomes a bit strange.

Several other comments suggest that, for quite a few years now, the weighing of safety
versus productivity has actually been to the benefit of safety. One rolling mill manager can
think of a positive recent example, where safety prioritized chosen at a considerable cost.
Most directly negative comments, however, do come from the rolling mill.

IP: For example, when we go out for inspection, we have these light gates, these lasers. If you
cross them everything stops […]. You’re supposed to go out and press a button to reset it, so that
nothing happens. But for example, if somebody goes out and pushes the button while people are
still working and then starts up…

………

IP: Say that a light gate breaks down or something. Then it’s ‘Should we continue or…?’ But then,
most often you work anyway, but you put up a note or something, [saying] ‘It doesn’t work’.

………

IP: It hasn’t happened that much lately, but before it could happen that you cut plates a bit further
down the conveyor, and you didn’t stop but continued running the line anyway.

………

IP: Yes, there was this… Maybe two months ago? We have these beds which are used to move
plates around, and there are chains. We were repairing a chain, and then at two o’clock we quit and
left. One of our maintenance guys was still there working. And then they wanted to start up and
make a test run […]. The technician is on him, stressing and stressing and stressing, so they start
the beds up to run them. If anybody had happened to run that bed, things would have gotten bad
for a couple of guys working with that chain. It’ll just say ‘Bang!’.

………

IP: The production technician spends a lot of time with us. And even though he pushes us and
wants things to go quickly, he always says ‘But do it safely!’ you know. And you go ‘Yeah,
right…’.

Other comments give the impression that explicit pressure is uncommon.
IP: But it is not like our manager says ‘Go faster!’; If things are looking hairy they don’t say ‘Go!’.
I haven’t heard that, at least not for 20 years.

Instead, another type of more subtle pressure is hinted, described here by a person from upper management.

IP: When I, as the person responsible for a production line, get a call saying that ‘OK, we have a break-down, we have to stop’, it should be a natural thing for me that the first thing I say is ‘Thanks for the information, remember to do this job safely’. Not that ‘Yes good, but when are we up and running again? How much work is left to do? Can’t we hurry? Can’t we be faster? We have to get it going!’.

SB: Maybe it’s harder to see the implications of that when you’re higher up?

IP: Mm, but at the same time, when machines break down a lot of decisions are made close to the floor. I would say that it’s easy for higher managers far away from the process to say ‘Yes, but think about safety’. But when you’re standing there in the smoke and dust, that’s where we have to give them the assurance to actually think safely.

This is echoed by a rolling mill section manager. She sees that some types of manager behaviour may be interpreted as production-centred.

IP: There is often a… At maintenance stops, there is always a dead-line. When machines break down you don’t have a dead-line, but you have a lot of people who [ask] ‘How’s it going? When are you finished? What’s the prognosis?’. You get that. And it’s often upper managers who want that information. And somebody has to go out and ask ‘How’s it looking? What do you think? Prognosis?’. Of course they’re stressed, there’s no escaping it.

When upper management of this section manager gets in touch, ”most commonly he calls to ask about production, when we can start up again and all that”. One person means that worker-manager interaction tends to deal with production issues rather than safety, and that technicians close to the work floor feel production pressures from above.

IP: Well, he’s told from above that ‘We have to produce’, so of course, it’s his job to make sure that we do.

Another person is sceptical to whether safety consequences of new technical or other work related implementations are reviewed in retrospect.

IP: No. You evaluate whether production has increased, but not whether safety has been affected. Sometimes it’s brought up on safety rounds though.

Under circumstances like these, one operator says, much depends on whether the individual worker has the strength to resist pressure.

IP: Then [in those situations] you yourself have to be a little… How should I put it? ‘I just won’t do it, that’s just the way it is.’. You have to be that strong as a person.’

At the steel mill, one person has seen a connection between safety and K-norms, which are norms to judge the quality of the steel which is currently being processed. By referring to these K-norms, workers are empowered to resist production pressure, because
such pressure can often affect product quality in a negative way. The relationship between quality and safety is also mentioned by a steel mill safety representative.

IP: But the strange thing is... You might think that the more we produce, the more incidents and accidents we will have, but we don't see that. Because you get another type of stress, it depends on how you work. [...] In our team, we work really well, we are this much better than all other teams, and we work very calmly. Our work is super-smooth and we have time to do everything, because we have a different way of working. If you work with lower tonnages like they do, you get more stress.

Education & training

Operators at both facilities state that safety training at educational programs or workplaces prior to SSAB employment is largely non-existent or forgotten. Those who have had industrial employments before coming to SSAB have many negative experiences and commend SSAB in that comparison. What knowledge operators have in safety matters has mainly been acquired during their current employment.

The steel mill and the rolling mill appear to offer very similar ranges of training initiatives for operators. Newly employed operators, both regular employees and summer substitutes, undergo an introductory safety training program. While interviewees often have vague memories of this training, introductory activities appear to have gone through several revisions over the last few years. At present, introductory training has the form of a package, covering general facility knowledge and prominent safety arrangements like “safe conduct”, typical hazards and personal safety equipment (PSU). It also includes the course Gas Protection 1, which brings up the handling of gas, the routing of gas lines, placement of gas valves and emergency escape routes. Gas Protection 2 is a recurrent activity bringing up similar matters. Continuing, new employees receive more specialized training directed at their work tasks, such as safety around fork-lifts or Hot Jobs training, which concerns welding and gas cutting safety. Hot Jobs is repeated every five years, which means that some people in the interview group have only attended once, quite a few years ago.

Other workplace-specific training is largely administered by the work teams themselves. For summer substitutes, training begins several months before summer, allowing them to learn from the experience of regular employees. It is however not clear to which extent this on-site training is formalized or standardized. Safety drills do not appear to be very frequent at either facility, although at least one rolling mill section has recently carried out a fire safety drill. Other comments suggest that there are large differences between sections in this respect.

The rolling mill incorporates a lot of heavy machinery. This creates a need for certain specialized safety practices. One example is special training in the “Break & Lock” procedure, which is meant to guarantee that a machine is not activated while maintenance personnel are inside of it. Two persons from rolling mill maintenance suspect that knowledge about Break & Lock is lacking within the regular work force. Break & Lock is something that affects their own safety very directly, and these persons have had many negative experiences in connection to this. One of them believes that different work sections apply different principles around Break & Lock, and that training suffers accordingly.
Another interesting safety training activity mentioned by many rolling mill workers is a type of initiative for “Safety thinking”. The specific form of this training is unclear, but its message is echoed in several statements.

IP: You’re supposed to think all the time, you know, it has to do with your life and everything.

...........

IP: Everybody’s saying ‘Think of what you’re doing, because it’s we who are responsible for acci…’. You know, most often it’s not the machines but we people who make things go wrong […] ‘Think before you act’, you hear that all the time.

Safety representatives receive special training and also have other opportunities to learn, e.g. during safety representative meetings, LSK meetings and study visits at other work places.

At both facilities, safety training is meant to be a natural part of introducing new machinery, routines or safety measures. Selected employees are commonly part of implementing new technology, although sections later on will show that this is not always done consistently. Their knowledge should be passed on to the work teams, but this often happens under informal circumstances. Some statements suggest that involvement depends on the scale of the project. Safety documentation for new equipment is routinely made available on paper or on the intranet, but whether employees make use of this information is not controlled.

Training versus experience

Steel mill upper management believes that there are enough safety training initiatives and that worker inclusion is quite good. However, there are few ways of evaluating the efficiency and effectiveness of training, and according to interviewees, training often has a technical focus. Furthermore, no deeper inquiries into the actual content of existing training initiatives have been made. Instead, management has mainly established that they do in fact exist.

On the topic of recurrent safety training, there is much confusion within the entire group of operators. Gas Protection 2 is supposed to take place two times every year at both the steel mill and the rolling mill, but whether this is fulfilled is unclear. Some employees believe that Gas Protection 2 is to be carried out only once a year, perhaps a hint to its true frequency. In fact, one person has attended this activity only two times during seven years. The same confusion applies to “Hot Jobs”. Two of the persons interviewed actually hold the conception that this is a one-time training activity.

Other initiatives, such as emergency drills and life-saving exercises, seem to be quite new. Several persons also suggest that actual drills have been unrealistic, and their frequency is unclear.

IP: At one time we’ve had, these emergency evacuation… You know, when you evacuate. I don’t think it happens very often. The problem is this thing with five-shift work teams, maybe you’ll do an evacuation every five years. And most often it happens under very controlled circumstances, so…
One person believes that these take place every five years. This is supported by another interviewee who has worked at SSAB for four years, but is yet to experience an emergency drill of this kind. One rolling mill operator has worked as a summer substitute the last 10 years, and half a year as a regular employee. This person has never taken part in any emergency exercises. Yet another employee claims that such activities like these do not exist at all. Whether summer substitutes and sub-contractor workers are ever included in similar activities does not become clear. Finally, a steel mill operator has experienced an actual emergency, and describes this as an altogether chaotic experience. In this statement, a difficult trade-off between safety and production is also hinted to.

IP: I’ve experienced it one time, when we had this gas leak, we were working then. But there was a bit of chaos, because nobody really knew what was happening, in here I mean, whether you should evacuate or not. But then we went to the assembly point anyway. But our work is the way it is, so it’s a bit hard to simply leave everything as well. Should you leave or not? Is it serious or not?

An experienced safety representative at the same facility notes that a general problem with steel mill safety training is the fact that steel making is a resource intensive process.

IP: Generally it’s good, but they have a hard time drawing us away. There’s a will, they want us to receive training, not just in safety but everything else, but there’s no staff to replace us. It’s really hard to let us go, seeing that we’re working with molten steel.

When asked whether there is need for more training, operators disagree. One person suggests that training should focus more on safety thinking and learning to identify risks during the work day. Several other persons also emphasize the importance of learning from your fellow employees, during the course of work. It seems to be a common conception that this type of learning is superior to courses which are isolated from the actual work process. One work manager particularly stresses the importance of experience, in contrast to training.

IP: We have this Gas [Protection] training, certain training that is included, safety training and all that. But there’s not very much more than that. You’re schooled on-site, that’s the way it is, and it’s very hard to give information [about safety] before you’re here. You can only inform about what you’re supposed to do, and you do receive that information.

This conception once again emerges when talking about the time of the last financial crisis.

SB: But you went through a lot of training during the financial crisis?

IP: Yes, well, it was a mixed bag. It’s really hard to do safety training, because what you need to show and learn is hands-on stuff.

SB: You mean that it’s hard to compare to when operations are running as normal?

IP: I think so. Theoretically you can, you can show roughly on a map that ‘Here it is’, but you can’t do much more than that.
Many comments from rolling mill workers appear to echo this conception. Here, the general conception is that a person’s understanding of work safety is equivalent to his or her work proficiency, and that safety is a matter specific to each work task. An experienced section manager supports this conviction. According to him, employees learn about safety most efficiently when training takes places during normal, day-to-day work. Today, introductory training spans over a day, but this interviewee would like to see it extend over several weeks. Much training already happens through experience of regular work, so what is aimed at appears to be a form of traineeship. This would provide more chances to bring up concrete examples of hazards in the work process and might also increase technical competence. The potential of learning from experience also seems to hold for activities not explicitly associated with training. For example, one employee states that he has learnt a lot about safety after his work group started managing their own safety equipment.

### Changes in technology or work patterns

The connection between safety competence and technical competence also applies to the question whether training is issued when new technology, work tasks or procedures are introduced. The steel mill manager is pessimistic.

SB: Is there any structured safety training when new technology, tasks or procedures are introduced?

IP: Probably not. I think we’re quite poor at that as a company, linking levels of training to… Linking that to safety, to any larger extent. That’s my experience anyway.

SB: So there’s a technical focus in training?

IP: Yes.

Similarly, a work manager suggests that workers should be more actively involved during the whole implementation process.

SB: Does new technology or procedures come with safety training, or is it evaluated afterwards?

IP: No, no, I can’t, no I don’t know about that. I’ve heard other people pointing that out in production. That maybe things are installed, but you don’t get information about until you’re sitting there. Then you’re supposed to learn, instead of doing it the other way around and start with training and information. […] I mean, there’s something lacking there, if you ask me.

At the rolling mill, two operators explicitly state that safety is meant to be addressed in relation to new technology, but a third person has more negative experiences. Quite recently, gates were introduced that automatically halt machinery when sensor light beams are broken. This implementation does not appear to have come with sufficient training.

IP: […] Well, we did get these light gates, and they hardly explained how they worked. So we had to figure it out for ourselves, ‘How do we do this when they don’t work?’

Another episode is related by a person from maintenance. Here he is asked whether education and training is carried out when new technology is introduced.
IP: Well, if it’s something very special. I know one time, they installed gas alarms on the furnaces, but they never informed anybody about how they sounded. They could never activate them so that people could hear what they sounded like.

SB: They couldn’t be tested?

IP: Well they probably could, but they never did, and nobody knew what it was when they started sounding. I thought that was very bad. They showed us that ‘Well the lights are blinking’ but not ‘How does it sound?’, nobody told us that. So we went by that place, and it was squealing and all that. ‘What’s that sound?’. We didn’t know that it was a gas alarm.

### Safety management training

Persons representing both corporate and local upper management are commonly recruited from within the organization. This is described as something of a company policy, striving to make sure that managers have a sound understanding of the work domain. However, several of the positions held by interviewees came to exist when the organization was revised a few years ago, which means that the definition of these manager roles is still an on-going process. In some cases, these persons have extended experience from the management of sharp end work.

Managers at all levels receive both general and specialized safety training, spanning from direct safety-related issues to legal matters. The legal dimension of manager safety training is dominating and typically has to do with existing work environment legislation, protective equipment, interaction with sub-contractors and labour law. Training that is more directed toward the sharp end of operations is undergone together with safety representatives. This involves an element of risk analysis (ASA - Work Safety Analysis), working with cases in groups, thinking about possible consequences of different actions. One section manager who has recently received this training describes it somewhat ironically.

IP: Yes, it had to do with these Work Safety Analyses, how to do them. And it was also how you’re supposed to think if you’re changing a tire in darkness, the right front one or something. All the dangers at the E4 [freeway], that you should watch yourself.

Even though managers at all levels go through several training programs, none of these programs appear to be tailored for actual safety management. Managers at different positions all play different roles in safety work, engaging in different activities, working with different tools. No special training appears to cover this, which is described as an area of possible improvement by a senior manager.

IP: Maybe not very clearly, there’s probably room for improvement there. We train people, and we develop our concepts of manager training you might say. What are your responsibilities as a manager, both legal aspects and what aspects we as a company place at the manager role, and what we expect people to do there. So that’s probably an area where we can improve.

This is echoed by a rolling mill interviewee. In this person’s preparation for the role as section manager, no training has been explicitly directed toward actual safety work management. There are templates for common activities such as Safety Group Meetings, but this manager thinks that these templates are sometimes incomplete.
IP: I would say that training for safety is quite poor. I feel that this is one of my large inadequacies, this ‘What should I think about? How should I act?’ . Sure, I attend safety rounds, I’m supposed to lead Safety Group meetings and all of that, but I’ve never been part of such a group. And then it’s pretty hard to go in and lead it.

SB: What the content should be?

IP: What the content should be, what the message should be, when I have nothing… I have gotten this basic, you know, that safety representatives go through. That’s three days. That’s what I have gotten as a manager, and the rest… Well, you have to learn by yourself.

SB: That’s difficult?

IP: That’s really difficult. I don’t know what I should bring up. So I have to look in old protocols from the former manager, ‘What did they talk about before? Oh, alright’. […] And ‘What is safety?’, so that everybody understands. That’s what I talked about before, ‘Oh, is that also part of safety?’.

At the steel mill, work managers evidently play a special role in day-to-day safety training, but some comments suggest that they have received too little guidance in this regard. Simply relaying information from higher management levels creates a somewhat passive role for these floor level managers.

SB: Do you miss something with regard to training?

IP: No, I… No, well maybe I might wish for something more than just me informing [the work team]. That it becomes more…

SB: It comes from you to a large extent?

IP: Yes, that’s the way it becomes, it’s more like information. I may feel that practical stuff is also, that you… I think there’s room for that.

SB: That it’s not just something you read out aloud?

IP: No, because now there’s often a paper issued saying that ‘This is how it is, and this is what we’re supposed to do’. So I’m sure that this could be developed.

SB: Information like that, what does it normally contain?

IP: It’s more establishing what we’re supposed to do, how we should work, what applies at the moment […] Most of it has had a large focus on that bit [safety equipment] lately.

However, steel mill management has recently directed attention to the training of work managers, trying to equip them with better means for administering safety work. It does not become clear whether work managers have been involved in the design of this training.

IP: Yes, we have to concentrate on front line managers to get anywhere with this, that’s completely obvious. It doesn’t help if I write something on paper and expect them to change out there, instead it’s a daily grind controlling that they’re following the existing rules around safety.
Communication

Parts of the Management Factors chapter describe the difficulties of maintaining a management presence at the sharp end of operations. This has the prominent effect that most manager-to-worker communications are carried out over Steelnet, through memos or e-mails directed at the collective of employees. Upper management has a pronounced will to visit the work floor but a high workload makes this ambition difficult to realize. In fact, even representatives of both steel mill and rolling mill management report little contact with management above these facilities.

For rolling mill section managers, maintaining a work floor presence is perhaps both an even greater necessity and a greater challenge. While the steel mill employs work managers as the authority closest to work teams, rolling mill section managers must instead cover areas five or six times larger, at the same time taking on a much greater administrative burden. Whether these persons maintain a close contact with the workforce seems to depend on the individual manager.

Mediums for vertical communication

Both local and corporate upper management communications with the workforce are with few exceptions carried out through intranet publications or e-mail. There have been attempts to use Steelnet for bi-directional communication. Primarily though, information flows downhill in this medium. One upper management interviewee envisions new ways of communicating knowledge about safety throughout the organization.

IP: What I want to do now when we have this new Intranet, is to create a Health and Safety-page, where we not only have information and directives and ideas and initiatives that are supposed to be carried out in the whole operation, but also somewhere a box with good ideas. Where we say that ‘These good ideas exist, we would be happy to see you copy them and use them at your facilities, but we won’t make it a directive for all to do so’. In that way, the manager or co-worker who’s interested can actually surf this ‘Good Ideas’ [page] and ‘That seems smart’. A short description, simple, the main features and a contact person.

Other comments from upper management reveal an uncertainty toward e-mail and memo communication.

SB: You communicate a lot over the Intranet?

IP: Yes, unfortunately, I would say. I’m not totally convinced that’s a good thing.

SB: What drawbacks do you see?

IP: Yes, well the largest drawback, I think, is that we rely on… The feeling that you’ve fulfilled your obligation of information is that you’ve published it on the web.

This person feels unsure about the way Intranet communications are received and perceived, although management relies heavily on it for cross-scale interaction. Similar views are expressed by other persons. These managers also see the value of individual, personal contacts.
IP: Then we’ve had a number of road shows over the years, where you invite all the staff. And I mean, that’s a good albeit blunt instrument, because not very many… If you have maybe 6-700 persons sitting in a room, not very many raise their hands and say ‘I have a question’. So I think what we have to utilize more, that is to spend time out there. I mean spending time in production, setting aside a day here or there where you actually… You’re just out there.

SB: “Management by walking around”?

IP: Yes, a little bit like that. To go out and meet people, walking into control rooms, introducing yourself, asking what they’re doing and… I think that’s very important.

Upper management concerns about the efficiency of on-line communications are mirrored by a work manager.

SB: How do you communicate with other managers in safety matters? Are there meetings about safety, for example?

IP: Not exactly…

SB: Is there any dialogue?

IP: No, I can’t say that.

SB: But there is some communication from managers to you?

IP: Yes, there is.

SB: Through the Intranet?

IP: Yes, but that’s more like information. Then it’s up to you. If I have any issues I will make contact.

Some differences exist between the steel mill and the rolling mill with regard to on-line communication. At the former, all employees now have personal e-mail accounts. At the rolling mill, however, operators at each section share e-mail addresses. One steel mill operator comments on this.

IP: You know, before we shared them. So LD had one address, and then they had removed information, because you try to keep it tidy, and then we who had been on longer leaves had no idea of what had happened. So there was a very short interval of information. But now when they send them out to everybody I can even sit at home and look through my e-mails, to see what has happened, what’s going on.

Summer substitutes, on the other hand, do not appear to have access to e-mail accounts at either facility, and are therefore structurally cut off from this source of information.

The Intranet contains a wealth of information, but in some cases it is difficult to navigate. Some steel mill operator comments suggest that the weekly publication, the ’Steel Paper’, is more accessible in that respect. This publication often brings up safety matters and is distributed to all work teams. One person from the steel mill notes that the actual access a person has to the Intranet may depend on his or her work tasks.
SB: Do you utilize the Intranet?

IP: Well, yes you do… A bit sporadically. It depends on what tasks you have as well. Like now, when I’m sitting in the control room I have access to a computer and the Intranet, so then I’m in there. But I mean, as I said, that’s a way for them to reach us, but it’s much harder for us to reach them you know.

Another, new employee on the same facility appears to perceive the intranet as something of a barrier. In this instance he is talking about safety procedures.

IP: It’s probably there, on the intranet. There’s so much, I’m fairly new after all. Am I supposed to force my way through the intranet? I just don’t do it. So most often I read the weekly bulletin.

Continuing, several other persons also make clearly negative comments about Steelnet communication.

IP: There is information to be gathered if you can be bothered to… Care that much.

SB: If you have the will or energy?

IP: I suppose it’s your own will. If you want to find something out, you find out.

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IP: It’s not a routine for me anyway. To go in and look, you know.

SB: I suppose that’s due to something. Does it differ, how interesting the things are that are posted?

IP: Yes, if it’s something really interesting where I am, then you hear it from the safety representatives.

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IP: Our Intranet page is so unbelievably complicated and stupid. I rarely look at it anymore.

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SB: You don’t have very much contact [with upper management]?

IP: No not really, not very directly as far as information goes. It’s more that you hear a rumour that there’s something at the intranet, for example. ‘Yes well, where is it then? Well it’s there somewhere, but I don’t know exactly where’, and then you have to ‘OK? I heard that there was something’, but you sort of have to seek it out yourself.

SB: What’s it like using the intranet?

IP: No, I don’t think it’s very easy to find your way around there.

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SB: Do you use it [the intranet]?
IP: I don’t visit it much at all actually. I don’t really feel I have the time for it. Not while I’m working. Then, when I’m on a brake…

SB: Do you have computers?

IP: Well we have computers where we work, but then you’re working and you don’t have time for it. Then I’m more focused on what I’m doing, otherwise things can go bad.

At the rolling mill, one person states that Steelnet is not used for two-way communication, but that this flaw is mediated to some extent by an on-line log book. This intranet feature, perhaps specific for this particular work section, lets operators communicate matters that they do not want to pass through the incident reporting system, such as general concerns, reminders or suggestions. As an alternative to formal reporting, the log book makes up a more undemanding way of voicing opinions about many different topics, including safety. This informality, however, means that issues reported here do not have to be processed with the same rigour as incidents or accidents.

SB: But the intranet is not used in that way?

IP: No, not for communication. It’s only the type of things that are announced. We have a log book, just for the cutting line, where we make notes if there’s something, suggestions or… It’s management that has pushed this, that as soon as you have an opinion, then it’s communicated to everybody.

SB: Do people use it then?

IP: Yes, I’m sure they do, I don’t know. I think it’s mainly people whining all the time, so I stopped reading that shit. It’s all ‘This is no good, and that’s no good’.

In fact, one section has heard requests for yet another log book.

IP: And now they were actually up here and fetched a […]. They wanted it on paper, just for writing down little things. Because they said that ‘Everything doesn’t have to be written down in the large log book. We want to be able to write some small things to each other, think of this or do this’.

**Worker-manager meeting activities**

Although direct communication between workers and managers appears to be sparse, some activities do exist where these persons meet eye to eye. One such activity particularly mentioned by steel mill employees are meetings held at the beginning of each shift cycle, something that is given positive remarks throughout. Work managers describe this as a relaxed activity with an open atmosphere.

IP: And that’s pretty good, because there we dare to talk about anything. Everybody knows everybody and it’s not a very strict event, we can sit down and discuss things.

Several operators share this notion, one connecting it to the presence of work managers.
IP: In the past it has been a bit tricky to get your voice heard, but this is damn good, because many of the work managers are damn driven in that way, and I think that’s damn good.

After meetings, a work manager states, follow-up is critical.

IP: Then it’s important for us not only to talk, but to act. So that they don’t lose faith in it. […] It’s me who has to push [those issues] and make sure that… In my case it’s [my section manager], and tell him that ‘We have to fix this’.

However, the structure and scope of these meetings seem to vary. Some meetings only include one work team while others engage multiple teams, and some sections let workers attend meetings with other teams than their own. Workers from one section state that managers are not always present, but that protocols are written which are later passed on to them. Another worker is more hesitant to whether results from these meetings are communicated to upper management.

IP: That probably depends totally on the work manager you have, if he has the energy to handle it. […] It really varies, the quality of… Because I know many who are dissatisfied with their work managers, and who do you turn to then?

SB: They are the way to reach upper managers?

IP: Yes, and they often receive pressure from that direction, so they’re really not persons of confidence.

Another person states that meetings are quite infrequent and that people are unused to discussing in groups.

IP: It’s pretty new, so… There’s a lot of time between them, so three weeks or more may pass. We’ve only had about four meetings, and it’s one hour, so it takes a while for everybody to get started.

Two persons state that safety matters are put first on the agenda of these meetings, but apparently this varies between teams.

IP: But it hasn’t been brought up as a point [on the agenda], ‘Safety’. But it comes up all the time though, you’re reminded.

SB: Is it common that safety issues are raised there?

IP: Yes, well it happens actually.

Because of organizational structure, similar opportunities are not as frequent at the rolling mill. Both section managers stress the importance of being available when workers wish to discuss safety matters. There are regular meetings, but an everyday presence is equally important.

IP: Just now when I came by they said ‘Are you here again?’. I think I’m more out there than in my office, I run around quite a lot. If there’s something I want to bring up, then I can stop for a break. I gather all of them and we can have a discussion.
Something that soon emerges, however, is that the high workload for section managers means that workers must take the initiative to communicate.

IP: If a work team sees that ‘This is wrong, this is a hazard’, they don’t keep it secret, I find out. Either they’ll send me an e-mail, or else it’s communicated through the Safety Representative, or else they won’t do this thing because it’s dangerous.

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IP: But often I think that our employees raise the flag, that ‘This doesn’t feel good, this isn’t OK, we have to look into this’. And that’s when I believe that some of our guys will be standing in the doorway, or go to my line technician. So it’s about communication, talking, that’s what I think.

A similar remark is made about risks around newly introduced machinery.

SB: It’s driven by operators and maintenance?

IP: Yes, and it comes up on every morning meeting, there’s no... You get to hear it, otherwise you’ll get angry e-mails or somebody at the door telling you. I don’t think that our staff is afraid to talk, maybe there are some who don’t dare to speak up, but then there’s probably another person on the shift team who does.

These suspicions from management are reflected in rolling mill operator interviews. Here, many persons become unsure when asked about opportunities to discuss safety matters. Answers vary greatly. Three persons cannot initially think of any such activities, and instead respond that safety issues are typically dealt with during the workday, when a particular situation calls for it.

Recurring meetings between section managers and work teams do exist, constituting the main formal line of communication between operators and upper management. However, there are comments suggesting that these meetings often focus on the development of production, rather than the development of safety work. Little contact is reported apart from these meetings. In fact, one operator does not even know who his manager’s manager is. Instead, direct communication is carried out with section managers, and to some extent with safety representatives or work environment engineers. In this respect, section managers are commended for their availability.

**Communication through proxy**

Opportunities for direct contact between workers and managers, as described above, appear to be few. Instead, both facilities have implemented organizational structures where worker-manager communications are relayed by intermediaries. In this context, many steel mill operators mention Line Technicians. These professionals have appeared as a resource in safety matters, and are often the go-to persons in such situations.

IP: Because you feel sometimes that nobody is responsible for anything, but now that we’ve gotten some line technicians it feels more like you have somebody to talk to, to turn to. Because now there are line technicians at every station who oversee what maintenance needs to be carried out.
At the steel mill, work managers have also proved a useful resource. Safety issues are normally raised with them, and they are expected to forward operator concerns to higher management.

On both facilities, work teams include safety representatives that meet regularly at Safety Group Meetings, and managers often visit these activities. Whether or not this caters for communication between work teams and managers, however, naturally depends on every individual representative. One rolling mill safety representative says that these activities have lost some momentum.

SB: But these Safety Representative Activities, I get the impression that their frequency varies?

IP: Yes I guess it does, a bit. It drops off from time to time, and then…

SB: Who controls that?

IP: Well, it has to do with the commitment of the Union Coordinator.

On the other hand, a section manager sees the action plans developed by Safety Groups as a way of forcing selected issues in the communication with upper management.

IP: We have these action plans we’re working on, and thanks to that I have more arguments when I go and tell my bosses that ‘Damn it, I have to… This is going to cost money, but it’s in our action plan, so you have to take this seriously’.

The issue of representation becomes particularly important at the rolling mill, because work teams have no in-team management. Here, work teams appoint a Group Representative who attends certain meetings on behalf of the whole group. A widely varying vocabulary is used to describe these events. Some speak of Group meetings held three times every half year, but also add that they are not normally held that often. Possibly this is what is referred to by another person as Section meetings, where only one work team meets with management. On the whole, knowledge is sparse about group representative activities, although some interviewees state that their representatives actively try to relay information to the work team.

**Horizontal communication**

There are numerous opportunities for Upper Management to communicate with other managers, both from within and outside of the organization. In the Swedish Steel Industry Work Environment Group, upper management representatives meet with their peers from other organizations. Here information can be shared in safety matters. Internationally, the World Steel Organization fills the same purpose. Although sharing information in safety matters with other industries has not been common for SSAB historically, this practice is reported to be on the rise.

IP: The general intention is to increase this. At SSAB, you might say, we’ve generally been too bad at seeing ‘What are others doing?’ That holds partly for technology, but also a lot for these areas [i.e. safety].

SB: I think that’s common for many industries. Maybe you often think that safety work in your domain has to be very specific?
IP: Yes, but in the end this is very much working with people. How you go about to get a good impact. It doesn’t matter what type of industry or area it is.

Section managers meet weekly to discuss current operations. At this activity, safety is normally a prominent subject, and recent incidents and accidents are discussed together with upper management. For new managers, these weekly meetings are a valuable chance to learn about how to handle concrete safety issues. In the past, managers have brought actual incident reports to this meeting, but the reporting system is now computerized. One new manager fears that this will lessen the extent or quality of incident discussions at the event, and thereby reduce the chances of learning from the experience of others. Even for section managers, communication with upper management both at and above the rolling plant is mainly carried out through Steelnet or e-mail. Closest upper management is often hard to reach and does not spend much time at the work floor. As a contrast however, there are attempts to improve information sharing in safety matters between sections.

IP: And if an accident happens at one section, then you send out images and information about it directly, so to say. We are very clear about that too.

Both at the steel mill and at the rolling mill, many opportunities exist for managers, work managers and technicians to meet and discuss safety matters. All interviewees that are asked, on the other hand, report that contacts between the facilities are very limited. There is safety talk in the management group for Metallurgy, but communication between the steel mill and the rolling mill is almost entirely focused on production matters. Despite the fact that these two facilities are situated a stone’s throw away from each other, they are in many instances described as entirely separate entities.

IP: No there’s nothing, nothing. No, the rolling mill and the steel mill, that’s like two companies. Like planning, who plan what we’re supposed to produce, they have more contact with Borlänge than with the rolling mill.

Lacking communication between operators may sometimes introduce great risks. One such event is described by a rolling mill operator.

IP: Many accidents have happened because information doesn’t reach the ones it concerns. [...]There were a couple of times with our cranes, when the scale doesn’t work the crane goes full speed for maximum weights [as well]. Because it has different speeds. If it has the maximum load, that is, when the ladle is full, then it goes on half speed, you can’t run it. Then, when there’s no weight on it, no ladle that is, then it’s full speed. But that time it went on full speed, and then they ran into... Because it doesn’t stop, because breaks and everything is calibrated to...

Reflecting the views of upper management and work managers, very few operators have experienced any collaboration in safety matters with operators from other facilities. One safety representative states that persons from the rolling mill sometimes attend steel mill safety rounds, but this does not appear to be common practice. Naturally, whether the things that are learned on those occasions are communicated to the work teams depends very much on every individual safety representative.

Operators at the steel mill meet at the beginning of each shift cycle, roughly every month, an activity which several persons describe in a very positive way.
IP: We don’t really have any grudges, we’re sort of… We’re one big family really. But we know that many work teams need to ventilate. But we’re really only there to pat each other on our shoulders, ‘We’re really good!’ But you need that as well.

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IP: And that’s pretty good, because there we dare to talk about everything, everybody knows everybody and there’s nothing uptight about it, we can sit down and discuss things.

Other persons find it harder to think of meetings where operators discuss safety matters. This type of information sharing is often more informal and takes place during the workday, although some events do exist to increase process understanding.

IP: Yes, well maybe if you work extra for another team. It’s not that we have meetings for that thing specifically, with other shift teams, I don’t think so.

SB: And not between different work places within the steel mill?

IP: Maybe a little bit, not very deeply. But you get that when you attend these facility knowledge courses, when you go around to all stations.

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IP: No, that is… We have our locker room you know, that’s where you meet maybe. And they’re my workmates. But we don’t meet the rolling mill, or the loaders.

On the topic of horizontal communication, one representative of upper management sees clear gaps. As far as he knows, there is no structured communication between work teams.

IP: I doubt it. I think that they primarily communicate production results. And possibly disturbances and that type of problems, but I can’t seem to remember that there is any structured information exchange in safety matters between work teams.

Between-worker communications at the rolling mill appear to be less frequent. A number of activities are mentioned in interviews, such as Group Meetings and Work Place Meetings, but these are almost exclusively directed at group and safety representatives, which in turn have to relay information to their work teams. Some events are only mentioned by persons from maintenance, such as morning meetings and special safety related meetings before planned maintenance stops. A section manager explains the cause for this pattern. Because production is always running, only group representatives can attend morning meetings. Maintenance personnel are freer in a sense, meaning that these persons are the most common to attend morning activities.

At the rolling mill there has recently been attempts to remedy the fact that operators seldom meet to discuss work, e.g. through so called “Handshake Meetings”. While most other meeting activities only involve group representatives or safety representatives, it appears that these meetings are directed at the broad mass of employees. So far though, handshake meetings do not seem to have reached full implementation. Knowledge about this activity is limited among operator interviewees, but one person sees a value in them.
IP: The point is that you’re supposed to… We have no problems in Team 1, but there are other teams where they don’t really speak to other sections. It’s more like ‘Hey! Let the plate go!’. So it’s supposed to get some communication going between [them], I think. Which is needed.

SB: You affect each other’s safety?

IP: Yes, and if you know each other, maybe it’s a bit easier to say ‘Hey, what are you doing?’.

Another person, however, believes that these events are mainly meant to improve production.

IP: Now they’re doing these handshake meetings to improve…

SB: Have you been there?

IP: No, I haven’t been there.

SB: It’s so that you can share..?

IP: Yes, to talk and see if you can improve something, they do it mostly to streamline [work].

SB: It’s production?

IP: Yes, it’s production.

One pattern typical for the rolling mill is the frequent mention of more informal ways of information exchange between workers. Such communication appears to vary between teams, but in some cases it is preferred over formal exchange.

IP: But of the other hand, I have quite a lot of spare time when I’m waiting to relieve [somebody]. Then I’ll go to other stations and say ‘Hey, how are you doing?’ and talk, and then safety issues may come up. That’s what you have to do.

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IP: We meet some moments before in the canteen, and then you often get to hear it. Because the machine operator is the one who knows about most things, and he often sits waiting in the canteen, so there you get to hear about any big things. But then you relieve people individually.

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IP: They have something called handshake meetings where everybody’s supposed to attend and talk, but it’s so far from… You know, formal isn’t always good. Many times informal is better. Last afternoon we had pizza together with our neighbouring section, and then you bring up... Then you talk about these sorts of things, it’s not more difficult than that.

Continuing, he states that these informal contacts sometimes mediate the fact that section managers cannot always be present.

SB: Not everybody feels like speaking up?

IP: No, and when you go through your manager it’s hard… And not everything is… You know, the way we work is not according to the prescribed… Well, we work according to the prescribed
norms, but we don’t follow the official, what we are and aren’t supposed to do. You just have to realize that we cheat every now and then, you know. And then it’s good if we talk to each other about it. And the formal [way] is pretty rigid and not functional. And it doesn’t bring up certain aspects on safety, and…

This last person also gives an example of a situation where operators make informal agreements.

IP: We had a crane that runs straight across the hall, and at one time it was broken, so it didn’t… It’s supposed to stop when the other cranes come, and it didn’t. And then they just said ‘No, then it can’t run at all’. But we wanted to run it anyway, so we called the drivers of the other cranes saying ‘Now we’re running for a while’. And they said ‘OK, then I won’t be there’. Ok, done.

SB: You can solve some problems on the spot?

IP: Yes, many times you can do that. You don’t have time to make an official risk analysis as they do during daytime.

Handovers

One activity where safety matters could be raised is during handovers. At both facilities, however, this activity is not formalized, and the nature of handovers seems to be determined by individual operators, technicians or by forcing circumstances.

SB: Do you talk about safety matters between the work teams?

IP: Yes, for example… For example if something has happened, then you have to say so, ‘You absolutely can’t do that, because then things might go bad’… ‘You can’t work now’ you know, at handover.

SB: That’s during handover?

IP: Yes, that’s very important, so that nothing bad happens. Other than that, damned if I know.

………

IP: At work you meet at the handover, but that doesn’t work very well. Communication between workplaces, and also between work teams, those things could be much better.

Many comments suggest that handover procedures are governed by the demands of different stations. Some stations are rolling constantly, and every new operator replaces a leaving operator.

SB: Do you have something at the start of every shift, where the work team meets?

IP: No, we just go in and relieve person for person, and then it just goes on.

Others seem to employ more typical handovers.

IP: Usually we have a quick talk during handover too. You take at least five minutes to talk about things that have happened, and if there’s something new that you have to point out.
Later, however, the same person states that handovers differ according to circumstances.

IP: Days like this one, when we’re not casting when we get here and it’s a while before we even start, we usually gather. For us at continuous casting you go to the control room. And there’s always someone who has been sitting in the control room during the previous shift, and it is his task to hand everything over.

**Reporting**

As part of a general drive to standardize certain parts of the Safety Management System of SSAB, the incident reporting system (MIA) has undergone a thorough revision over the last four years. Reporting is to be made more accessible for employees, and follow-up on errands is to be facilitated. It is only first now, however, that it has reached the stage of broad implementation.

Managers at both facilities put a great weight on this activity, constantly pressing the matter when communicating with the work force. Consequently, reporting figures have been on the rise. Some interviewees connect this to a generational shift within the workforce. Younger operators are believed to be more prone to write reports. According to one person, reporting is now a wide-spread activity.

IP: You can see it. You write a lot more accident [reports] now than before. It used to be almost embarrassing, you didn’t know the forms were, and instead you went about limping. Now you write on everything, because later on it might happen that you stretch your back, so then you write on it. But we encourage people to write on everything as well. We have a goal to reach 200 written incidents for example, to be able to work on them. And we follow up on incidents once a month.

Operators at both facilities are encouraged to write incident reports, both by workmates, safety representatives, managers and technicians. At the rolling mill especially, between-worker pressure to report appears to be common.

IP: I usually think ‘Could something have happened?’. That’s the way I think, but then I don’t know how others think.

SB: But it’s up to every person? Or do you talk about things that happen?

IP: Yes well, most often if I have said that ‘Shit, that was…’, they just [say] ‘But write an incident [report]!’ And then I think ‘Yeah, an incident [report]!’.

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IP: Yes, when I stepped into the bed... Then I was urged to do it right away, and everybody pressured me to write, and I just ‘Yeah yeah...’.

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IP: No but... As I say, you encourage... If somebody gets hurts and it’s something special, you urge that person, ‘Of course you should write an incident [report] on that’. It’s like I say, it’s not only the safety representative but your workmates too, who push you to write [reports].

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SB: But do you discuss within the group what to report and not?

IP: No, there’s not a lot of discussion, but you point out to another person maybe that, ‘Of course you should write an incident [report]’, you say. And then it sort of gets done, and then there’s nothing more to it.

Most interviewees have some experience from writing reports themselves, although it is not a very frequent thing to do. There are many comments suggesting that the reporting of incidents is seen as a way for operators to exert pressure.

IP: The more incidents there are concerning one single thing, the more they get that they can bring up to management that ‘We need money to improve that thing’. Because unfortunately, bosses and management only see that if it’s not black on white that something has happened, then nothing has happened.

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IP: Because you know that something happens if you write [reports about] it. You know that nothing happens if you don’t write that incident [report].

Increasing the amount of reporting has required great efforts. In the past, one interviewee says, operators were almost ashamed to make reports, and many types of injuries were practically ignored. In order to increase reporting a rule of thumb has been created, stating that events making a person go “Oops!” should be reported as incidents, whereas events provoking an “Ouch!” should be registered as accidents. There does, however, seem to be differences between work teams or individuals as to how this rule is applied.

**Need for improvements**

At this time the older, paper based reporting system is being phased out. While some note its benefits, for example being able to bring the paper form with you, the new system is highly anticipated by most interviewees. Before, reports have gotten lost and handling times have been high.

IP: When you’ve written an incident [report] and you hand it in to me, and them I am to speak to the one who’s written the report, safety representatives are to sign it, and then I’m to leave it to my manager who’s supposed to sign it, and then it has to be registered into the MIA system. That can often take a couple of months.

Several managers want to improve feedback, connecting it to the willingness to report.

IP: That has appeared now, the last two years. And I think that’s good, because then this guy gets something back, or girl, that someone really cares that I write it.

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IP: What’s important for a manager, that’s to give feedback. If somebody writes an incident report, that he could have hurt himself, that you give feedback quickly to the person who did it.
Delays in the chain of handling often make feedback suffer. While accidents are handled quickly, processing of incidents is often slow. This is testified by several steel mill operators.

SB: But you personally don’t receive any feedback?

IP: Not for incidents in particular, because they are passed on to… What are they called, the ones who work with safety?

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IP: That’s a pity, the fact that there’s no automatic feedback on reporting. Then you yourself have to remember that ‘That’s right, I had an incident, how did that turn out?’.

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IP: Then, maybe you don’t get that much feedback very often, it’s hard with daytime, shifts and all that.

SB: Who delivers this feedback, your closest manager?

IP: I think so, I really don’t know actually. Or if it’s the safety representative. No, I can’t imagine that. It should be the manager.

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SB: Are there follow-ups after incidents, with discussions, feedback, what’s happening in investigations?

IP: A little bit, but I guess it’s a bit so-so. Information is a bit poor.

A number of rolling mill operators make similar comments.

SB: Is it easy to follow your own report? Do you get a good feedback?

IP: No, I can’t really say you do. At our [workplace] it’s been… You sign a paper about what’s happened and all that, and then there’s not much more. Then you get a copy of it, and then…

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IP: You get tired of it after a while, because nothing gets fixed. And it’s an awkward… With a lot of standardized questions that don’t apply to this particular case, which I have to answer anyway.

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IP: If I say that I want to wear a sumo costume at work to protect myself I would like them to explain to me why it’s not going to be practically possible, you know. I want my sumo costume anyway, but I’ll understand why it’s not… Or to get a good explanation to why not. That’s enough.
Yet another person has a recent example where feedback has been lacking. A problem has been reported on his station, but there has been no clear feedback. However, this errand does not appear to have gone through the official reporting channel.

IP: The dangerous thing is if you don’t manage feedback, giving us feedback, for example that they provide a new planing bed for summer. […] The risk is, if you don’t do it, that people get tired of reporting. It’s no use doing it. And that’s an example where they haven’t… We haven’t really reported it as an incident I think. But anyway, it needs to be remedied.

Operators hope that the new system for reporting will quicken the pace of incident processing, and thereby improve feedback as well. One section manager does have some worries concerning this system revision. She notes that although paper forms can easily get lost, it has at least been possible to bring it with you, filling it out during meals or breaks, sometimes even during work. It is not certain that operators will take the time to sit down at a computer solely for this task.

IP: Maybe you can’t always have a computer window open during work, because you’re using the computer for some work task. Yes, but then we have [other] computers behind them, but then you have to get somebody to relieve you, to go write it. And sure, maybe you get a break, but maybe you don’t get… We may be so tightly manned that you don’t have any more time than your break, and then you don’t want to use your break to write incident reports, and then frankly you can’t be bothered to do it.

Furthermore, there is also some worry that older employees will not be as prone to use the new computer system. However, this is not to say that everybody has been comfortable writing reports by hand. There are instances where section managers have even offered to help operators to write reports. It is unclear whether this will also be possible when reporting on-line. The new system also contains a new reporting category, Risk Observation. It is hoped that this new concept will help operators discriminate between incidents and accidents.

IP: Then, I believe that many must learn… You know, very many write incident reports although there was an accident, so that I have been forced to make them write a new one.

SB: Maybe some things become normalized?

IP: Exactly, and now we’re getting something [else] as well, ‘Risk observation’, so that’s going to be interesting.

SB: What does that mean?

IP: Well, it’s ‘Supposing…’, you might say.

SB: Yes, that’s going to be part of reporting?

IP: Yes exactly, you can tick the box and ‘If that screwdriver had fallen from the crane, this might have happened’.

Still, the same person worries that Risk Observation reporting is structurally undermined. According to her, issues filed under this category will not activate the regular
procedures of investigation and intervention. In this statement, some confusion can also be seen regarding the definition of incidents.

IP: You don’t have to work in the same way with Risk Observations, but… Maybe [we need] something more than not working with it at all, so that they’re not forgotten. Because I think they’re very important. I mean, when it has come to incidents something has actually happened, that is, we should be able to catch it earlier, through risk assessment.

**Definition of incidents**

Management hopes that the computerized system for incident reporting will increase reporting, through ease of use, lowered processing times and a greater process transparency throughout. However, some issues emerge during interviews that are neither directly linked to the mode of reporting, nor connected to design flaws in the current paper based system. As an earlier quote shows, one person from upper management believes that too many matters are made into safety issues.

IP: And safety, I can tell from the amount of issues I receive from employees, that very much is made into a safety issue. Things you might discuss, ‘Is this..?’ Like parking, is that a matter of safety? Well, so far as cars may be in the way of fire trucks, perhaps handicapped [people] don’t have their spaces and so on, but this becomes... When you want some action, and add a bit of weight to a question, then maybe you make it into a safety issue.

The image emerging from floor-level interviews, however, suggests that the opposite is often the fact. At the steel mill in particular, a far-reaching normalization of accidents is reported by both workers and managers. Typically, minor burns are regarded as an unavoidable part of work, sometimes even as a mark of achievement. Beyond the use of “Oops!” and “Ouch!”*, a great uncertainty exists around the classification of common events. Here, the group of interviewees appears to be divided in those who have decided to report “every little thing”, and those who are more prone to wave off certain types of events. The message from management is clearly to report everything, although only one person believes that this is common practice.

IP: Yes well, people have always reported incidents, but maybe not as... Maybe you’ve thought that ‘This wasn’t that bad’. But nowadays you do it even if it’s a small thing.

Contrary to this, several persons suggest that possible incidents are not always scrutinized. One safety representative makes the following statement.

IP: But then there are some incidents where maybe... ‘Was that really an incident?’ Someone had [reported] that a protection plate was missing, but it’s not really a protection plate. It’s not a safety hazard, it’s only a protection plate.

SB: It’s hard to find the right level?

IP: Yes, sometimes I think there are very silly... Nothing can happen you know. ‘Could something happen? No. Then why is it an incident?’ you know.

When the same person continues, it becomes clear that there are also events where an actual potential for injury exists, but which are still not regarded as incidents.
IP: But sometimes you might think that some incidents, you know… ‘But that’s…’. ‘You tripped, you didn’t get hurt. And there wasn’t a bump either. You just tripped, you were just clumsy’. We have too many of those, you have to find the right level for incidents.

This statement is echoed by several others. Although the following person seems to have caught management’s message to increase reporting, there is something clearly negative associated with the phrase ‘every little thing’. He also hints to the importance of manager presence at these occasions.

IP: Now I feel you’re supposed to write incident reports for every little thing. But maybe that’s the point, I don’t know. But incident reports are written every now and then, but there could probably be more if you were to write for every little thing.

SB: You mean it can become too much?

IP: Well it can’t really become too much, but maybe you don’t think that some things are really incidents. But they are.

SB: You can view things differently?

IP: Yes, I think that some people write… There are some who write for every little thing, and some who write less.

SB: Are you encouraged to write reports?

IP: Yes, you… As I said it depends on what has happened, but… If something happens at our place and the manager isn’t around, then we have to encourage each other. But it’s not… As I said, for me, it depends on what you think, but I think ‘That’s nothing to write about’.

A third person has a very similar conception.

SB: Are incidents harder to see [than accidents]?

IP: I think so, because everybody doesn’t know where the boundary for incidents lies. One person might think that ‘Oh, this was an incident. I passed over this place when I wasn’t allowed to’. And tripping, you know. You do that, how many times don’t you trip every day? Am I supposed to write an incident report every time?

One interviewee, employed since seven years, does not attempt these deliberations. However, this person feels that managers sometimes share the above related attitude to certain types of incident reports.

IP: But it still feels like it’s a bit awkward when you write incident reports, like ‘Did you have to write a report on this too?’.

SB: You get that feeling?

IP: Yes, that has happened. Because I always write [reports]. As soon as I say ‘Ouch!’ or ‘Oops!’. There was very much talk about that a few years ago, because then almost nobody wrote incident reports. And then there was a lot of nagging that you should write for everything, you know. But then, maybe it became a bit too much.
At the same time, there is some creativity when it comes to incident reporting. When the concept of incidents is widened several issues may be connected to safety matters, as related by one interviewee. This way of viewing incidents does however not appear to be very common.

IP: I can tell you about one funny thing. Our toilets on LD were closed off because they were broken, and because I manage fining, that goes on non-stop, I don’t have time to... I knew I had five minutes to go to the bathroom, so I run off and trip on a staircase because I have to rush off. And that was because of stress, and because the toilets didn’t work. But it’s still an incident, because of stress.

Interestingly, rolling mill workers seem to apply the “Oops!” and “Ouch!” rule in a much less problematic manner. Here only two persons say that unnecessary incident reports are sometimes made. Although the following person, a safety representative, has previously stated that the definition of incidents is clear, he also says that there is room for discussion.

IP: Yes, well, you can write ‘x’ amount of incidents everyday if you feel like sitting at... Writing on papers all of the time.

SB: Or at the computer?

IP: Or at the computer. But as I said, when you’ve worked a while you don’t think that everything is an incident. Even if it actually is, according to managers and stuff, you see things a bit differently when you’re at the floor.

interaction with sub-contractors

If upper management sometimes finds it hard to maintain communication with the sharp end of the organization, difficulties are perhaps even greater when it comes to sub-contractors. What is more, many recent serious accidents have involved workers from other companies. SSAB employs many large sub-contracting firms, some with several hundreds of employees of their own. Neither the steel mill nor the rolling mill hires sub-contractors to perform the duties of operators (i.e. staffing companies). Instead, these firms are occupied
with maintenance tasks, performing cleaning and technical repair. This means that sub-contractor workers are especially frequent during major repair and stop days. In turn, much maintenance is carried out during the summer months, which means that an increased amount of sub-contractors coincide with a large portion of summer substitutes. For some work teams, about one third of the operators are summer substitutes during certain periods.

Controlling the way outside employees go about their work is very difficult. Instead, SSAB uses safety contracts and places demands on the training of sub-contractor workers. A person from local upper management comments on this.

IP: I feel that the game rules between us and the sub-contractors are fairly clear, there’s nothing difficult in that. What is difficult, the next thing, is to follow up and see that sub-contractors actually do what we say they should do.

Several initiatives have been created to tackle this. Sub-contractors are to clock in at the gate upon arrival, apply for work permits and perform risk analyses. A person from corporate group upper management states that such competence may factor in when sub-contracting services are procured.

SB: Maybe it’s hard to evaluate the sub-contractors competence in those things?

IP: Yes, and if you don’t have those resources, then you might think ‘Is this the type of companies we should work with?’.

Both upper management representatives initially state that the safety work of sub-contracting firms is acceptable, and that no substantial problems exist. Activities are regulated in several ways.

IP: I believe that that works fairly well, without knowing any details. But we have regulations for safety work, for visitors and other persons who enter the steel mill, that they receive a safety briefing before they go out into production.

Another person from middle management shares this notion.

SB: Are there any safety problems around sub-contractors?

IP: No, I can’t say that there is. We have some people who help us, Foria for example, who run their machines in here. There we make a safety plan for every year. They’re so used to this place. So we go through this once every year, risks and what reconstructions have been made, so that they are aware. […] And we have routines for that, they have to call before entering and they must receive an ‘OK’. So I think that operators feel that this works.

However, when this subject is pursued further, the upper manager does see some issues.

IP: But of course, there are quite many safety problems with entrepreneurs and other [persons] doing work for us. We have a couple of examples that I’ve been processing, the last quarter you might say. We had a pretty serious incident a couple of years ago, where we almost knocked over a loader with an overhead crane lifting a ladle. And after that we established some rules, mainly for communication between sub-contractors, management and operators. That had gotten lost in the re-organization, so we have picked it up again and we’ve had discussions about it.
This issue of subcontractor-worker communication emerges in several other interviews. One work manager does not know to which extent sub-contractor workers are trained, although he thinks they should receive the same type of training as new SSAB employees.

SB: How does cooperation work with them?

IP: No, I can’t say that’s good. But that’s not only because of them, that depends on those who have hired them. To inform and pass that information on to us.

SB: What type of information are you thinking about?

IP: For one thing that they’re there at all, that’s lacking. And what they’re going to do, for how long, who’s responsible for them. That’s often missing, and we’ve had that discussion continuously, still have.

Among worker interviewees, it is a common conception that sub-contractors are more prone both to suffer accidents and to cause them.

IP: They are supposed to receive introductory training. Then, if some of them have missed it, I don’t know, sometimes you wonder. Or if they forget. They run around without their helmets, under and over, ‘But I’m just going to…’. And then you have to tell them, and they become really pissed because they can’t work. ‘Well, you have to wear a helmet’.

.......... 

IP: I think they could do a lot more work training them.

SB: Why is that, you think?

IP: Well, that they aren’t informed about the dangers in here. And they want it as cheaply as possible, that’s the thing.

SB: And it takes time, of course.

IP: Yes, exactly. And I know, I have many friends who have been hired [by sub-contractors], and their equipment is really lacking.

SB: They bring their own stuff?

IP: Yes, or none at all. You know, they work at winter, no jackets. I who work for SSAB would never do that, I would just walk away.

[...] 

SB: But don’t you ever meet them under any circumstances where you can discuss safety?

IP: No, they can just come in saying ‘We’re going to work here’, if they even do that. Sometimes you see them going about their business… No, that’s very bad.

..........
IP: I usually tell them actually, ‘Hold on now, look up. Put on your helmet. Put on your glasses. You can’t be standing here like that’. But I don’t think everybody does that.

SB: Is it hard to communicate with them?

IP: Some are very good. But often they come by and say ‘Hi, we’re doing a job here’, but most often they don’t come back and tell you when they’re finished, so then you have to go look for them. But now I tell them, ‘I want you to come back when you’re done’. […] It’s very much up to myself, it depends very much on me. But some don’t give a damn and ‘He’ll leave when he’s done’.

.......... IP: Yes, there’s been… Many incidents have happened between hired people and we who work here, that they don’t know what we’re doing and when they can… Yes, that a bit shaky.

SB: And that you don’t know where they are maybe?

IP: IP: Yes, it can be that way sometimes, you hardly know anything.

.......... IP: And one thing that I think is very important, that is that they report when they arrive somewhere. When they take a break they’re supposed to tell you, so that somebody doesn’t just appear afterwards. In my experience that can be improved.

Although there is some mention of attempts to keep track of sub-contractor workers at the different stations, neither facility appears to have implemented a general system for this task. Some statements indicate that sub-contractor workers are to register themselves on a whiteboard upon arrival, and presumably erase themselves afterwards. This procedure, however, is not precisely known to managers, and whether it is common practice remains unclear. At the rolling mill, one section manager sees other dangers in this.

IP: Yes, if we have an evacuation drill in here, or an evacuation. We don’t know who we have in here, it’s such a large area, I don’t know who’s here.

SB: You don’t record that very strictly?

IP: Yes it’s recorded at Maintenance but they don’t really sit here, and I don’t get that… I don’t have that information so to speak.

Another remark from a rolling mill employee also suggests that sub-contractors have their foremost and most natural contact with SSAB maintenance staff.

IP: […] they don’t readily go into our control rooms – or maybe they don’t know where we are – to tell us that ‘Hi, I’m here, my name is Kalle and I’m going to be here, I’m going to work here’, and ‘Goodbye, now Kalle’s all done’. They don’t really. They communicate more with persons on the maintenance side, but not with my staff.

On the other hand, some rolling mill operator comments suggest that this issue has been improved.
IP: But it mostly happens before summer stops, when they go to see what they’re supposed to do, and then they forget to report that they’re there. [...] But I think they’ve gotten better, that they can’t just barge in, that you sort of have to report that ‘Hello, now we’re here and now we’re going to…’. [...] In this year that I’ve been here they’ve been pretty good at saying ‘Hello, now we’re here’ and ‘Now we’re finished’, things like that.

Another person tells of a local system for managing these contractors. This solution was developed because sub-contractor employees often failed to use the proper “Break & Lock” procedure.

IP: So now we changed it, we discussed it at one of our group meetings, that we have one [person] who is responsible. Who has a list of all the tasks, that ‘This is supposed to get done’, and then when you’re finished you’re supposed to talk to them, sort of. Then that person checks off that ‘Now it’s finished, then we know that’.

**Democracy**

Both the steel mill and the rolling mill have implemented numerous functions where, at least in theory, workers are given a chance to influence safety work. Frequently mentioned examples are morning meetings, work-team meetings once every shift cycle, workplace meetings, safety group meetings and meetings within local and central safety committees, although many of these only allow for worker involvement via representatives. Continuing, TPU activities are mainly concerned with improving quality of work through maintenance, but they also involve workers in the acquisition (and sometimes try-out) of new personal safety equipment. Finally, managements of both facilities report that operators are routinely involved in the development and introduction of new technology, work tasks and procedures, and so called VOICE surveys are carried out at regular intervals. At the rolling mill, maintenance personnel mention Friday meetings and meetings before planned maintenance stops, where operators are also meant to be present.

**Democracy through representation**

Many steel mill operators become uncertain when asked whether workers are represented in any higher safety functions. Two persons mention worker representation in LSK, the Local Safety Committee, TPU work, and in the Safety Group. Feedback from this group is mostly given if any problems or issues have been identified.

SB: Do you get any feedback from those meetings?

IP: Yes, well we do. That is, if everything is OK, then you don’t really think about it, but if something has to be improved then we get to know, because then it has to do with us.

Another worker, however, has rarely received any feedback from higher meetings concerning safety, and a third one does not know whether they are open for worker participation at all. On the other hand, a manager suggests that the appointing of work managers may have increased the opportunities of worker influence, although there are some doubts.
IP: I’m sure it was more difficult before, when you had managers on daytime, and you saw them quite rarely. So regarding time, technically there are better opportunities today. Then again I don’t know, given that we have to activate our work managers in safety matters, it’s not that certain that they’re interested in discussing safety.

In rolling mill work teams, Group Representatives are appointed to take part in certain higher level safety activities. There is, however, a suspicion that the authority of these persons varies greatly, depending on the leadership skills of every individual representative and his or her relation to the work team. Continuing, because of the large areas of responsibility for rolling mill section managers, they depend very much on the support of safety representatives. For example, one important task of representatives is to give workplace safety training to new employees and substitutes. One section manager has a strong confidence in the competence of these persons.

IP: The Safety Representatives have extensive knowledge. They undergo much training, and good training, often better than for managers actually.

SB: They also make some study visits..?

IP: Yes, well not that often. Then it’s normally the manager who arranges visits. But Metall [the Union] have a couple of courses that are damn good you know, so Safety Representatives know what they’re doing.

On the other hand, the other section manager is unsure.

IP: Then, I do want some support from my Safety Representatives, but there I’m not sure… Some Safety Representatives are very good, but I don’t know if all of them understand their role.

SB: You hear that sometimes, that it’s not clearly defined?

IP: No, exactly. And then, I don’t require my Safety Representatives to stand before groups talking, if they find that unpleasant. I’m not afraid of that, so I can do it instead, but I want them present. And then you have the [Safety] Coordinator who comes walking by and sees something… You have to dare to speak up, and that goes for all… You have to care about everybody, everyone has responsibility out there.

Because Safety Representatives are brought up in numerous contexts during rolling mill interviews, this theme is probed further. When asked about the role of Safety Representatives, one person answers that they are supposed to have a strong presence and that they should “know everything about safety”. One example given by this interviewee is to monitor the use of personal safety equipment. Other persons interviewed, however, are not as certain.

IP: Well, I guess you turn to him if you notice that they [managers] don’t listen, but I have never had to use the Safety Representative, so I can’t talk about that.

SB: But it’s not the first person you go to?

IP: Noo, I don’t think so. At least I haven’t.
Another person is more explicit, saying that he deliberately avoids going to Safety Representatives in safety matters. Instead, he communicates directly with his section manager. This worker has a long history at SSAB, and in his eyes Safety Representatives often lack the proper experience. They do have the mandate to stop work when hazards emerge, but he himself also feels empowered to do this.

IP: The way I see it… It’s a bit different from person to person, but most Safety Representatives… Not much happens there. They issue some notice that ‘This is how they have said that things should be done now’, you know.

A third person, himself a safety representative, states that the role of representatives has become unclear. They have no real status and their actual mission is vaguely defined. According to him, Safety Representatives should lead safety work. In comparison, another Safety Representative has different ideas about his role.

IP: I don’t have any more tasks than anybody else, really. I do have a bit more authority.

SB: You can stop work, for example.

IP: Yes, nobody else can do that. Or they can, but those things are different. Otherwise, all persons have the same responsibilities concerning safety.

SB: But you Safety Representatives receive some special training?

IP: Yes, that has more to do with what you are allowed to do, and not. It’s not so much about work safety in itself, it’s more about your rights.

**Operator involvement in work planning**

Comments by steel mill upper management suggest that worker involvement in the design of work tasks is quite extensive.

IP: We’re quite restricted by rules, but we have devoted much time to something they call SOP, to reach a standardized way of working over the work teams […].

SB: Is it easy to make those generalizations?

IP: On some stations it’s relatively easy, and on some it’s harder […]. The initiative was taken by the former steel mill manager, who worked out these SOP’s together with line technicians at all stations. But then they held a couple of calibration meetings together with operators, before the SOP was finished. Management has said that it is completely OK to deviate from an SOP, but you have to say that you did it and what you did, so that you can see afterwards… You get a very good opportunity to think outside of the box, that you see that ‘This was actually better’.

On the matter of worker influence over work planning, one work manager states that there is a large degree of freedom, on certain conditions.

IP: We’re pretty much free to do what we want. You have to produce the right tonnage at the right time, then how we go about to do it… Sure, we have norms to follow, but our hands are pretty much free.

The other work manager does not share this conception.
IP: Well, we have such a complex… On the workplace, it’s more guided by production, how we work that is, that’s the way it gets. And after that you have to make adaptions around it.

On the worker level, answers appear to differ slightly according to what work section a person belongs to. Some state that work can only be performed in the way it already is, while others believe that operator influence is profound.

IP: Yes, we do, at LD. We have quite a bit of influence in fact, it’s almost as we are in charge. Because otherwise, it won’t work.

SB: But does that differ between different work places?

IP: Yes, generally… I don’t know, some have given all power to the work manager, they’re hardly even responsible for their own work. But we decide very much how to work, and then we inform the work manager that ‘This is the way we’re going to do it’. And sometimes we don’t have time for talk, and then we inform him later.

Another person seems to share this notion.

IP: When we start our shift, we talk within the group.

SB: Before every shift?

IP: Yes, because we don’t work against a production plan. In other places you have to go directly to your station and relieve somebody, but we talk within the group for about ten minutes, ‘You go there, and you go there, and…’.

For other teams it appears that this type of participation is mainly a feature of shift team meetings, where different shift teams working the same section can discuss ways of performing shared tasks.

At the rolling mill, many workers claim to have a large influence when it comes to manning, deciding how tasks should be distributed within the work team. When it comes to the design of work tasks however, nobody has any clear experience of worker participation. Here, typical answers are that “You can’t do it in many other ways” or “We work in a line. There’s not much to choose from, you just push on”. One person is presented with the thought that this line was also planned once.

IP: Yes, but I haven’t been a part of that. Sometimes they make a push and come down to ask us you know. But then it becomes demanding for them, they can’t have it the way they want, so… They don’t come asking again.

Another person responds in a similar way.

IP: You can’t change very much. Maybe you can change the way cranes are run, but not those sorts of things. You cut the plates and…

SB: But they must have decided how to work at some point?

IP: I’m sure they have, but that’s a hundred years ago maybe, that’s how it feels.
Design and implementation of technology

One steel mill section manager states that workers are routinely involved in the introduction of new technology, but this opinion is not shared by his superior.

IP: You know, I would say that we don’t have a structured way of working when it comes to implementation of technology, or technology in connection with safety measures. In those situations it is pretty much ad hoc, you manage every new situation.

SB: There are no initiatives like participatory design...?

IP: I’m sure it exists in some project model, in the same way that there are a number of AFS’s and this and that, but in reality it doesn’t work. We are quite bad at managing projects, at this firm. [...] You never set aside enough resources to review the management of projects.

These conceptions are shared by the two work managers.

Yes we can give our opinion, but many times we are overruled. It’s sort of decided in advance, but they ask for the sake of appearance. That’s the way you feel.

SB: So there’s no guarantee that the new equipment is compatible with your way of working?

IP: No, exactly.

SB: Do you turn to your line technician then?

IP: Yes, I do. We often have meetings about it, but generally it ends up the way the company has decided.

..........

SB: If new technology is introduced at the workplace, are you involved in that process?

IP: Partly, but there is a bit more to ask there, there is. I don’t know why, I haven’t thought that much about it. But it’s something that I have reacted to as well, that you should put more focus on... If there’s any new equipment or ways of working or...

Most operator interviewees have experienced participatory initiatives in some form. However, many find that it is not done consistently.

IP: That really varies. I perhaps don’t feel we have very much influence. Like the ladle maintenance station, a station where there’s been a lot of reconstruction lately. Many girls have been replaced there because it’s a heavy job. The guys in our team had many ideas about things, how to construct it. They had a proper project a year ago that came to nothing. Because they built things where our ladle maintenance guys said ‘It will never work’ you know.

Another person has similar experiences.

IP: But about certain things they’ve gotten this idea that ‘We have to do like this’, and you say ‘That’s not going to work’. ‘Well we have to do it this way’, and then that’s the way it turns out. But you never get any feedback to whether it actually worked. So that depends very much on who’s managing the project, I think.
A third person connects these situations to sub-contracting.

IP: Sometimes we have a problem with… Sometimes consultants handle those things, and then we have a problem, because then it’s their way and they don’t see to what operators want. […] It’s happening right now, they’re working at the collecting station and they won’t listen to them. Unfortunately, and it’s a shame, because they won’t feel motivated to use the new equipment.

Work with TPU receives one positive comment.

IP: And then a bit with TPU as well, where we get to manage all safety equipment ourselves. It feels like you’ve become more aware of what equipment there is, and what you can use to protect yourself.

In other teams, procurement of equipment and testing is mainly administered by the closest manager, or driven by a safety representative. In these cases workers are unsure of how the procedure works, and feedback is sometimes lacking.

SB: If you need new safety equipment, are you invited to share your views?

IP: Well, I guess we do. We can say what we think, but then whether it…

SB: But if something is issued and it doesn’t work, then you have a say?

IP: Yes well, you can always say what you think. But I mean, whether they listen to what you’re saying, I don’t know.

Finally, one work manager notes that the reporting of incidents may also function as a democratic tool.

SB: How do you motivate people to do that?

IP: No, well, those are obvious things. That if we’re to get something done we have to write incident reports. If we don’t we can’t get it, otherwise it’s not on paper.

SB: It’s a kind of influence?

IP: Yes, it’s a confirmation that something’s wrong.

At the rolling mill, one section manager has previous experience from an instance of worker collaboration in technical revisions. At her former workplace, an operator was appointed to communicate between work teams, technicians, engineers and managers during development. In turn, he also involved more operators in certain design tasks. This proved a very positive experience, and it is the intention of this section manager to tackle future projects in a similar way. The other section manager does not share these experiences. Here he is asked about worker involvement in technological implementations.

IP: No, that’s mostly through Safety Representatives, suggestions and ideas from others… Well they don’t have any. They have nothing to offer in a way, they don’t know anything.

Three operators mention influence in these matters through their Safety Representatives. The nature of ASA activities is largely unknown to most interviewees, but
some Safety Representatives do gather information from work teams before ASA targets are
decided. One person from maintenance, also a Safety Representative, states that he is often
part of testing new equipment. He adds that representatives also get to visit Safety
Exhibitions. Most interviewees, however, are unsure.

IP: Not that I know of really, no idea. You can post suggestions, I’m sure you can, but...

........

IP: I suppose you don’t have very much influence. Management imposes regulations about what to
wear and not to wear, and...

SB: They don’t make investigations or surveys before introducing new safety measures?

IP: If it has to do with our section, they do an investigation. If it has to do with the mill generally,
they say ‘This is the way it is’.

A third person has at least noted an increased will to take in worker perspectives.

IP: Maybe not concerning safety equipment, but this new management, they’ve been quite apt to
come out and hear our views about what’s… I believe so.

A fourth person instinctively feels that he is involved, but finds it hard to give concrete
examples.

SB: Are you involved in safety work, selecting equipment for example?

IP: As a matter of fact, yes. After all, it’s us who work down there, so you get to have influence.

SB: But how does it come about? Do you get to choose your own safety equipment?

IP: I think… No, not selection, I think.

SB: Or testing?

IP: No. We don’t do testing either, actually.

Some persons state that workers are involved in the implementation of new
technology, commonly through a person representing the work team, or through safety
representatives. The two persons from maintenance, whom are also Safety Representatives,
state that maintenance personnel are often part of new technical implementations. However,
both see that worker representatives often enter into these projects a bit late. Furthermore,
safety is not always at the top of the agenda.

IP: […] and then you get to join in, as a Safety Representative or as an operator. Maybe Safety
Representatives and operators as well. And then they also get to be part of the project and share
their views. Sometimes things have happened a bit too quickly, that we’ve come in too late. And
then the machine is already constructed, with all its faults. And then it’s too late to change
anything.
This interviewee seeks a more strict form of project management, where safety is more clearly prioritized.

IP: Technology sometimes comes first, and then cost, and then noise and safety come later. It easily happens that when the machine is already there and it’s paid for, you do a bit of what the risk analysis says, and then it’s done. And then they move on to another project. And then there’s a lot of remaining work to do, noise reduction for example. But then they’re gone you know, and nobody has any money anymore.

Interviewee comments suggest that follow-up risk analyses after implementing new technology or procedures are not very common, or at least do not reach the majority of operators. Several answers make it clear that revisions like these are mainly driven by operator initiatives.

IP: So some things you can’t see before starting up, but you don’t do an ASA number two, it’s more from case to case. You go in and analyse that particular issue then. You may call it an ASA, but there’s not very much documentation.

.........

IP: No, you evaluate whether productivity has been increased, but not if safety has been affected. Sometimes, though, it can be brought up at safety rounds.

.........

IP: It’s more if there’s gripe from operators, you know.

SB: That’s the way it’s happens, if there are complaints.

IP: Then you’ll have to look at it. That’s more the way it works.

.........

IP: Not that I see anyway. That is, follow-up consists of us telling them that ‘This was no good’, you know. That’s the way things are in my world, anyway.

.........

IP: Often you get indications from production staff and work managers that there’s something not quite right. Something’s off, there’s something wrong.

**Focus of safety work**

The question of pro-active versus reactive safety work is apparently an active topic within SSAB, and has been for some time. Management speaks of a clear ambition to work more pro-actively, primarily through prospective methods such as different types of risk analysis, but also through the more elusive concepts of “safety thinking” or “thinking safely”. While management interviewees mention several examples of important “safety thinking” initiatives directed toward sharp end operators, it appears that this approach has not been applied to the same extent for office personnel. Neither do safety matters appear to be an
explicit part of recruitment of managers at any level, although safety training for such employees has been revised and expanded. However, there have been attempts to involve Procurement in early safety reinforcing measures.

Local safety management works both independently, implementing their own ideas about new safety arrangements, and with implementing safety initiatives developed by corporate upper management. Different types of safety rounds and risk analyses are used extensively at both facilities, in both directed and more exploratory manners. Thanks to the practice of risk analysis, management reports, several major hazards have been uncovered over the last years, some of which are still being processed. There is a clear focus on physical barriers and technical solutions to answer these hazards and few examples of organizational change are brought up in this context. Some have a short time-span, such as improving the possibilities of quick evacuation from the steel mill casting area. Others demand a slower change, e.g. work to lower the amount of dust inside the steel mill. In order to give such tasks a high priority they are assigned a so called “Q number”, signifying a safety order which is prioritized over all others. The amount of assigned Q numbers is also monitored and followed up weekly.

At both facilities, perhaps more so at the rolling mill, large efforts are made to develop barriers. Consequently, barrier-type safety measures are omnipresent, taking the form of personal safety equipment, alarms, gates, enclosures, automatic safety mechanisms and regulations. At the rolling mill, where a lot of heavy machinery is used, there is also common mention of Break & Lock systems and automatically breaking light gates. Many work tasks are governed by procedures and K-norms, although presently, procedures with a safety focus do not seem to be very common. Finally, the work floor levels of both facilities are practically covered in warning signs, reminding about the use of PSU or communicating safety-centred messages.

Closer to the operator, efforts are made in ergonomics and in the promoting of personal health through exercise and diet. A great emphasis is also put on individual behaviours, malpractices and attention issues, matters meant to be covered by the promotion of “safety thinking”, and in a more hands-on approach by the 30 Second Analysis. Managers also report that positive and negative behaviours are dealt with directly, in weekly bulletins and during daily interaction with the workforce.

One limiting factor in safety work is the fact that serious accidents are not very common. Designing safety work is made harder when there is little information to guide new measures.

IP: Also, it’s hard. We don’t have that many accidents after all. And then years pass, and I don’t really know how to work actually. You don’t have any concrete examples. I have a few from this year, but then there have been no accidents for one and a half year. [...] It’s hard to know statistically where to put your efforts.

SB: To get a sense of your state?

IP: You hardly ever have accidents with equipment or machinery that people often speak about, or where the staff knows that ‘There are problems here, this crane malfunctions and it goes its own way’. Instead it’s sudden events [that cause accidents].
A central initiative often mentioned in connection to pro-active safety is SSAB One, explained here by a representative of local upper management.

IP: SSAB One actually came from ABB at one time, called T-50 or... You know, it’s about reducing lead times, in reality it is a production based program. And you’re supposed to work with different... You have a whole toolbox. And you have a couple of [persons] that we call ‘Green Belts’ and ‘Black Belts’ and whatnot, some English affair. And then they work with different methods of analysis to show what you could do to streamline [production]. And there’s a large ingredient of housekeeping in this. Where we see that tidiness, moving tools, putting them at the right place [...].

SB: So it is a handshake between production and safety?

IP: Yes, you might say that.

The first attempts at implementing SSAB One, however, were largely unsuccessful. This is explained by an internal resistance toward adapting external ideas, and to some extent the autonomy of individual SSAB facilities in relation to upper management.

**Common hazards**

On the steel mill, minor burns, crushing, tripping, spraining, over-exertion and falling objects constitute the most common injuries or directly injury-related occurrences. Steel spatter is capable of inflicting serious damage. In these situations, steel fragments either find their way inside a person’s clothing or simply burn right through the protective layers of a person’s PSU. Moreover, massive forces are managed during day-to-day operations. To give an idea of the scale of operations, one worker gives a typical example.

IP: You’re supposed to report to the Work Environment Agency and all that, but sometimes it’s not that easy to find the [right] level. Because what you see at our workplace, we [accidentally] drop 20 tons, and then it says in the paper that ‘Dropped 20 tons, that’s a huge load!’, and you go ‘What? That’s nothing’.

At the rolling mill, just as on the steel mill, serious accidents have seen a continuing decline over the last years. This is attributed to persistent safety work, incorporating or refining several pro-active safety activities. Many risks still remain, however, in an environment dominated by extremely heavy machinery and powerful industrial processes. For example, the electric engine powering one rougher is several stories high, consuming as much electricity as a typical Swedish town, and one cylinder used for pressing steel slabs into plate can weigh approximately 300 tons. Accidents here are typically related to tripping, misstepping, slipping, crushing, cutting, or getting hit by moving objects such as cranes or plates of steel.

Working environments of both facilities are markedly aged. This presents certain problems in pro-active safety work.

IP: And it’s really hard, you have to fit so much in a small space too. And then, somewhere you’re supposed to have an ergonomic work place, and that’s really difficult.
IP: Now we have many machines that are really old too. They’re not all new, the cutters are from the 60’s and... And we’ve modified them and put up barriers and photo-cells and all that. But still, it’s old equipment.

**Thoughts on cause-effect relationships**

While LTI rates are monitored, severity rates of accidents that make up these numbers are not. There is, however, a widely shared conception that the absolute majority of present-day accidents do not result in more than one or two days of sick leave. SSAB facilities in the US display quite different numbers. Although the total number of accidents is similar, absence due to illness is much more uncommon. This could have a cultural explanation, according to one upper management representative.

IP: I saw then that out of our same number of accidents, they resulted in an unbelievably greater number of sick leaves compared to the USA. But if we could have offered them another... I mean, if you’ve cut your finger, and you’ve gone in to get stitches. But you can sit in the control room, or help to... Like they do, they have much more of this where they teach, if they’re experienced people they’re put in a teaching position then. And I mean, we can’t handle that. If they’re sent in for cutting themselves, they come to the emergency ward and then they get a bandage, and then they’re put on sick leave, and then...

SB: It’s an automatic process?

IP: Yes, exactly.

Local upper management has struggled for some time trying to explain and deal with the current situation. Physical safety measures have been revised and developed, there has been an increase in pro-active safety activities such as risk analyses and safety has generally been placed higher at the agenda. Despite this, numerous accidents still occur. SSAB has connected this to what is referred to as “behaviours”, but the link between safety management and such behaviours has been hard to establish.

IP: What I feel that we are missing are these mechanisms. We don’t understand the mechanisms that control peoples’ behaviour. Because we don’t really have any methods of controlling climate, or actually saying that... Why... You often wonder about that.

Representatives of corporate upper management share the conception that operator behaviours should be made a priority in current safety work. According to an in-house model of safety work, behaviours and attitudes make out the discrete final step of a staircase.

IP: If you take the general, laws and regulations, we meet those reasonably. There’s probably room for improvement, but we still meet it. If we go into machine safety, safety devices and emergency switches and barriers and those sorts of things, you may say that we meet that as well, there are probably improvements but... And at the top of this staircase we’ve put behaviours and attitudes, and I think that that’s the thing we’ve worked on the least.
Figure 2. The SSAB staircase of safety development and Zero Tolerance

Instances where all proper safety measures are perceived to be in place but where operators still appear to act unsafely have created the conception that attitudes around safety have to be tackled in a direct manner.

IP: Yes, and we can create a rule that ‘We can’t climb more than 20 centimetres, otherwise we have to use a ladder’. But somewhere I don’t believe in this rule guidance, but that we have to work more with peoples’ safety consciousness and their way of thinking.

Other comments also suggest that "behaviours" are regarded as root causes in this context.

IP: I mean, yellow [traffic light] is actually, you’re not allowed to go through a yellow light, but many of us push the pedal because ‘I have to make it before the red light’. And somewhere I think that’s what’s causing these small, crushing injuries, sprains.

Another representative of corporate upper management gives a very similar account.

IP: Almost always when we come down to ‘Why did this happen?’ it’s about... Equipment has not been lacking, there has not been too little training really, there has not been unsafe machines. Instead it has been that you’ve taken some small shortcut, or it may have been... Yes, well you haven’t really thought things through properly in advance.

This person also concentrates on individual factors in connection to dangerous situations.
IP: In one out of a thousand times maybe something happens that you couldn’t really foresee too, of course, but most of the times it’s about that last mind-set, that last bit of safety thinking. [...] Really, our greatest task at the moment is not to think of very much more equipment or other things, instead it’s a mind-set, it’s to get people to think along these lines.

One alleged manifestation of this mind-set is operators that “take short-cuts” during the workday. This expression appears to be firmly rooted at many levels of the organization, because it emerges in upper management interviews as well as in interviews with local middle management and operators.

IP: I mean, you take these short-cuts, ‘I’m only going to do this’. You know when you’re about to handle a large... Yes well, there are strains, you over-exert yourself, get a bad back and have to leave for a couple of hours, and you go to the hospital. [...] We have very many cases like this, it’s an overshadowing part, where you fall from the same level. That is, you trip and things like that. And that’s about people taking shortcuts over stairs, they ride the handrail instead of walking. Everything from that, to uneven floor grids that people trip on, and so on.

Safety statistics differ between the Oxelösund, Borlänge and Luleå facilities, where Oxelösund has had the gloomiest outlook for some time. One person from upper management connects this to a “masculine culture” surrounding the handling of molten steel.

IP: There has been a bit more of a masculine culture left in Oxelösund, and they say that themselves as well. They probably washed that away to some extent in Luleå, at an earlier stage. And Borlänge, somewhere in-between, haven’t had this molten steel, but they’ve had a number of other things, with a fairly disjointed layout of production out here, where transports are running up and down, many kilometres of railroad track within the compound and so on. [...] There’s no difference in that we formally have the same training for people, or that we have equipment and so on, but [it’s] the culture issue that has progressed to a different extent [at the different sites].

The same thing is brought up by another person.

IP: The closer you come to the molten steel in our business, the more you see it. It’s a masculine job, they’re awesome jobs in a way, and they’re only for real men.

SB: In the oil industry blue nails have been seen as something of an achievement. Maybe that has a counterpart in small burns for example?

IP: Yes exactly, it’s supposed to show that you work here, you know. And that’s exactly what we have to get away from.

As an alternative to such masculine behaviours, one manager wants to bring forward an attitude of caring.

IP: I’m convinced that what would improve our performance in this very much, that would be if people started to care, that they speak up. And we don’t understand the mechanisms which control that. [...] We have tried and said that ‘Care! And show some concern in that context’. And that people should start interpreting it as caring and not that you’re trying to meddle.

Steel mill conceptions
Speaking about possible causes behind the most common types of injuries, one manager touches on a form of accident normalization.
SB: What do you think lies behind these minor accidents?

IP: I don’t think you perceive them as risks, tripping about, not in comparison to those [things] considerably worse in a steel mill.

SB: It disappears in...

IP: ...in the noise of these major consequences that may occur. And at the same time there’s a fairly big time pressure, to keep the production chain intact. That’s my conclusion.

This normalization has also been seen when work teams list their five greatest risks, a pro-active safety activity attempting to involve operators in risk analysis.

IP: And then I’ve said that ‘I wonder if you’re not somewhat blind to this, because I can see at least ten risks that are worse than these’. [...] But there I’ve realized that issues like having ladles full of molten steel above your head is such a given thing that they don’t even consider it a risk. [Instead] it can be something right out stupid, like ‘Our micro-wave is too slow’. Well, you name it, there’s a lot of that shit, so there’s still a lot of education to be...

Continuing, he claims that injuries such as burns are often due to negligence.

IP: People are even cheating with simple things like wearing protective glasses, and other types of personal safety equipment too. And to a large extent that’s why you get burnt, because you don’t have your personal safety equipment.

Another management representative states that hazards such as these are inherent to the steel mill working environment.

SB: What do you think lies behind those types of accidents?

IP: Most often it’s heavy equipment. It’s a heavy industry, and then we have molten steel. So it splashes and, even if you wear protective clothing bits of steel may fall down, they find their way in and...

SB: That’s the way this environment is?

IP: Yes, that’s the way it is.

SB: It’s difficult to work with safety in this environment then, how do you manage this in safety work?

IP: Well it’s all these ASA, risk analyses that you do. [...] Then, technology progresses, you can take samples in LD furnaces using lances. I mean, the worst way is maybe to protect yourself with PSU [Personal Safety Equipment], the best way is to try and remove it through construction, so that you get rid of... But I feel that that’s the last step.

SB: That’s what costs?

IP: Yes, PSU is cheapest after all. But as I said, I don’t feel that we have any problems. When we’ve got some idea that can [improve things], then we most often get to see it through.

In comments similar to those of upper management, work managers also report that certain types of injuries are commonly overlooked or belittled.
IP: But it’s hard to protect yourself entirely, because is spatters back [at you]. Then, it’s kind of cool as well, to work at a steel mill. There’s supposed to be some burns and jumping spatters.

Although this is described as an attitude, another person states that injuries such as these are almost inevitable. When these managers are asked about the reasons for such minor accidents, they mention both individual and environmental factors.

SB: Why do such things occur?

IP: It’s molten steel, then burn injuries easily occur. It doesn’t matter how well you protect yourself with clothing, it jumps and finds its way in between and...

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IP: Yes well, it’s poor attention, because I mean... We have the workplace we have, everybody knows it. We have a lot of different levels and running cranes. So it’s more that you’re mindless.

However, when the same person is asked what this mindlessness might be due to, he gives a slightly more specific answer.

SB: But what might that be due to?

IP: There may be many reasons. It may be that you’re new, but then it may be that you’ve been here too long as well, that it becomes routine. You take things for granted, you suddenly believe that you don’t need to lift your feet, so that... I think it’s divided [between those] there.

During another part of the interview, the same work manager mentions other factors that may also influence operator attention.

SB: Does work pressure vary a lot?

IP: Yes, it does. And it’s very much the way things are as well, with temperatures and dust and all that. And of course, the closer you get to summer, the hotter it gets. And naturally you won’t be as sharp, especially at the casting bridge. It’s hot.

Several steel mill operators echo management’s suspicions about a normalization of certain risks. One person mentions this explicitly when talking about what he thinks is an under-representation of burn accidents in statistics.

IP: What we have on paper is tripping injuries. It’s not burn injuries like you might think. Although, I have some... Because I think it’s burn injuries anyway. Because it’s a fact that we steel mill workers, we... You know like this, you get burned and then sort of ‘Oh well...’. It’s part of the workday, and that’s where I mean that there should be more.

Other comments seem to reflect this suspicion.

IP: It might be burns then, maybe. But it’s smaller splashes and the likes, that’s not so damn dangerous.

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IP: Well… It comes with the job.
SB: That’s what you say?

IP: Yes, I don’t know... The work you do, you always have to be careful and think about how you’re working, otherwise it’s easy to... I mean, this burn injury happens out of bad luck, because you have a big cutting torch and you’re melting the slab, and then slag comes flying at you. If you’re unlucky it ends up in the back of your neck. I mean we have neck protection, but it can end up at your back and then it burns right through your clothes after...

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IP: But burn injuries are small splashes like this… I don’t view that as… It’s an injury, but if I get burnt like this on the fingers, I probably won’t write a report about it.

In accordance with work manager comments, operators feel that it is easy to become blind to hazards with time.

IP: Everything is so god damn big here, we’ve got... So you become so damn blind too. At the end, a thing that weighs 200 kilos, you think you can take it, but that’s not the way it is. And then something snaps.

Moreover, these types of injuries are viewed as something unavoidable, even unimportant, by several interviewees.

IP: Some things are pretty much unavoidable. When opening the ladle for example, there’s a lot of spatter, and it doesn’t matter whether you have this big god damn helmet, and coat, the full outfit, because if a piece of steel jumps in it does.

SB: It can happen anyway?

IP: Yes, of course it can. But I mean, you get small, small burn marks. It’s not so god damn dangerous in that way. But I mean, it’s probably close to impossible to get rid of it anyway, I would think.

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IP: Yes well, that’s because it splashes sometimes, and that’s not something you can control really. Sometimes a small [piece of steel] will... Like yesterday for example, [Operator], she got burnt. Something came off... There was something that came off and fell into the bath, so that there was a splash, and she got some slag on her. And then she got a bit burnt. [...] Sometimes you can’t see, you may not even be able to see that things are hot. They don’t have to be red-hot, and maybe you grab hold of it, and it may only be a second before you get burnt.

When asked about the causes behind the most common types of accidents, operators provide a multitude of suggestions. The above mentioned unpredictability of splashing steel can sometimes be explained by activities in other parts of the facility.

IP: But when slag is flying around and things like that, that’s often when the hall gates are open and the wind is rushing in. That changes the direction of the flying slag, so you always have to make sure to close the gates.

SB: There is a bit of unpredictability there? Are there other people who open the gates?
IP: Yes, there might be, at the other end of the steel mill. [...] You notice it right away, because when you’re grinding you can’t do it with the wind in your face, because then everything will blow up at you. And all of a sudden somebody comes in who doesn’t think about that. I haven’t been burnt so far, but in those cases you have to stop. But a bit of communication, that would be enough I think.

In other cases, apparently also quite common, people cross sections of the workplace which are off-limits during certain stages of the steel making process.

IP: I mean, some son of a bitch is standing in front of the furnace, and quite often there’s a lot of spatter when we’re cleaning it, well it’s bloody obvious that somebody’s going to get hurt, he’s not supposed to be standing there.

SB: But it happens that people do that anyway?

IP: Yes, but it hasn’t happened when we’re cleaning though, because we run out and [shout] ‘You!’ . That happened today, somebody crossed the burning plane and we told him, I mean he knows. That’s the stupid thing, but you have to tell them off properly, otherwise it won’t have any effect, that’s just the way it is. You get really pissed off.

This is connected to another comment about worker attitudes to safety.

IP: But a lot has to do with attitudes as well, it’s a lot about if you put on your silver robe whether you want to or not. Everybody knows that it’s supposed to be worn. It’s a lot about attitudes, it gets so damn hot in here and you start neglecting it. It’s your own responsibility in that way.

The other common type of injuries has to do with tripping, which interviewees connect to time pressure and stress.

SB: Why do these things happen, tripping or burn injuries?

IP: Well there are uneven floors, it’s not exactly neat and tidy here, it’s not in military order. I want military order around everything, I want to be able to walk around with my eyes shut and find my things anyway, but that’s not the way things are.

SB: Why is it so hard to keep things in order?

IP: Maybe we don’t really have the time, to handle it. So we have to get somebody else to help. I mean the ordering, making decisions, making...

SB: Structuring..?

IP: Giving it some structure, yes. That’s pretty much a whole employee [position] at LD for a while ahead until we get things in order. That’s the biggest things if you ask me. Why we get a lot of injuries, that’s because things aren’t in their right place.

This lack of time is reported by several other interviewees. Work pressure varies, both during the shift and over larger time spans. Expressions such as “clumsiness” or “awkwardness” are infrequent during these interviews, but when they do occur they are also connected to time pressure.
IP: You can’t have protective equipment that protects your whole... It [steel spatter] can enter through some small hole or anything, things like that. But then, crushing injuries, sometimes you can be clumsy as well, it differs.

SB: But nobody wants to be squashed, so what may be behind it?

IP: Stress maybe. Yes, most often it’s probably stress, because the tempo is pretty fast sometimes.

The steel mill process is tightly coupled, so that disturbances in one end may be transmitted throughout the production chain. The steel is constantly cooling and has to be processed while within the right temperature range, something that introduces another type of time pressure.

IP: Everything is regulated from one station to the other. For example, continuous casting, if you’ve started casting at that section and there’s supposed to be two, you know, more ladles are coming, sometimes it might be stressful if there are delays at one place.

SB: It spreads?

IP: Yes, it becomes... And maybe you become a bit stressed, you take some shortcuts here and there, and then something might happen.

SB: Is that part of the job, that you have to take some shortcuts?

IP: That’s the way it gets. Unfortunately that’s how it is, you’re not supposed to take that risk, but that’s the way it gets.

SB: Management talks a lot about not taking shortcuts.

SB: Yes, but if you don’t, then there’s going to be a stop. Then they’ll have to disrupt [the process], and that’s a lot of money. The thing is, you’re not supposed to feel that way, but what are you supposed to do? You feel the pressure, you have to make it on time. Luckily, accidents rarely happen, most people know enough to avoid situations like that, but it might happen.

SB: But you don’t want to mess things up for other stations?

IP: [nods]

Other sections are not directly connected to this strictly controlled production plan, but there may still be room for trade-offs between safety and productivity.

IP: But then the slabs may be very hot, because all slabs come directly from hot storage. And if they’re too hot you can’t even walk on them, because these shoes can only take 300 degrees [Celsius] and then they start melting. So you don’t want to try working on those. But then they may be 290 or 280, and then it’s still bloody hot when you’re working in the radiant heat.

Some comments also seem to mirror the conception that small injuries are often due to different types of erroneous actions or omissions.

IP: Then, it doesn’t have to be your fault either, somebody else might have done something. I know many times, for example at the casting section, they’re working very close...

SB: It can be tight?
IP: Yes, it becomes crowded, and then somebody holds something hot, turns around and touches somebody else’s legs. I mean, it happens so easily.

In some instances, events such as these are explained by forgetfulness.

IP: It almost never happens, and when it does it’s really not that dangerous. And many times it may be that you’ve forgotten to change to a pair of thicker gloves for this task, and then you have to take that spatter, because then you have error of conduct instead.

On the other hand, other comments connect burns and tripping to lacking experience.

IP: I’ve been burnt many times, and normally you’ve got the right protective gear, but... Last time, for example, I got a piece of steel in my shoe. I had the silver robe and everything, but it burnt right through and ran down my leg. [...] It’s always... The more used you are to a task, the more you know when it’ll happen. That was when I worked a station where I haven’t been very much, so I guess there was a bit of unfamiliarity to it.

A few women are part of the interview group. These are the only ones who mention macho attitudes as an explanation to minor injuries. In particular, this may be seen in situations where brute force is preferred to using the correct tools, e.g. when heavy lifting is required.

IP: Some guys are really smart, using lever arms and so on, but some think that ‘I’m a man, I’m strong, so ―Huh!’’

In some ways, attitudes such as these are mirrored by the work environment itself. Many parts of the plant are old, stemming from a time when steelmaking was an exclusively male profession. Another woman speaks of a work task which is hard to manage for people with lower bodyweight.

IP: We have one place, where you’re supposed to bring a chain down to the floor and hook it to a wheel, and then the wheel helps it to rise to the right level. It’s supposed to go up here, it’s for aluminium... And then, when I grabbed that chain, I flew up with it. Because I was a bit too light.

SB: It’s an old workplace.

IP: But now I build it up with pallets, and then I lift it up. Many people use that line, but I take care not to, because...

Trade-offs such as these, where work flow and speed is weighed against the use of tools or protective equipment, appear to be an ever-present challenge for operators.

IP: Everything is so awfully big here, and if a huge crane is to lift this little little thing, and then it’s too much or lets it down too much. It happens very easily, and then there’s a hand or a finger in there.

Another person also tells of a work task where such a trade-off can be made.

IP: Well, for example that you’re walking on a poor bed and you misstep. Then, you may be walking around working on slabs that are uneven for example.
SB: It’s the working environment?

IP: Yes, you may work around it through walking beside the slabs all the time. I’ve tried to learn to do that. But it’s harder, so it’s not as good, but everything takes time to learn.

Some comments imply that work teams are strained by the relocation of certain safety tasks from management to the sharp end, and that it may often be problematic to add to their burden. On the other hand, one person states that she normally goes beyond these recurring checks.

IP: I always try to think about safety. I always use all the protection that I can. Even though you’re supposed to check emergency showers on every morning shift, I always try to tug at them when I’m lighting the cutting torch. You never know if somebody has shut off the water or something.

**Rolling mill conceptions**

When rolling mill managers are asked about common causes for accidents, they refer to individual misbehaviour in a way similar to their steel mill counterparts.

SB: Despite all new equipment there are still many accidents. Why? What is lacking?

IP: Attitudes, Behaviours. To a certain extent how we are, how we think as humans. To avoid stress, ‘I was only going to...’ that is.

SB: Why do people think that way, in your opinion?

IP: Well, it’s hard to say really, but... We’re supposed to be here for eight hours. Time doesn’t pass any quicker because you stress. It doesn’t really, but maybe you want to manage more in the same amount of time, or maybe you’ve gotten more on your table.

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IP: But the accidents I’ve had this year, they haven’t had anything to do with safety equipment or anything like that. It is errors of conduct or stress factors or... It is really. So the absolute main issue, these accidents I’ve had this year, that’s about thinking before you do something.

Failing to see present risks is also explained in terms of a blindness to the working environment. This is touched upon when one manager talks about an instance where a staircase had been out of order for some time.

IP: I said ’We need you, you should be able to come home in the same state as when you got here, and if something happens when you’re there, where will you go? You have to have that staircase’. And then they became embarrassed, the ones who had been told the previous week. So, I hope they learn something. [...] Because I think they’re blind to it. Yes, they’ve seen that staircase, it’s been standing there. And they pass it by every day, several times a day.

Although stress partly appears to be conceived of as an attitude, some comments do suggest that shift work carries with it certain challenges.

IP: Yes, and my two most recent accidents have to do with that [stress]. One was when a steel [plate] wouldn’t come loose, and last night, what was it? Half past three in the morning. They were wrestling with it, they couldn’t get anywhere, and then one [person] made the decision that ’Screw
it, I’m going behind the cutter to try and get it loose from there’. And then it came loose, but then the steel fell on top of him. And you would never do that, I mean, when your head is completely clear so to say, when you’re on point during daytime, you never would.

Continuing, it becomes clear that other circumstances apply during the night shift.

SB: You don’t have the same resources during the night?

IP: No, we have the shift mechanic and shift electrician to call on, but there’s also some pressure to get production going, so...

When more general factors behind successful safety work are discussed, one section manager mentions available time as the foremost variable. And time is often scarce.

SB: That’s a problem for everybody?

IP: Yes, and that they don’t put more and more on our shoulders. Because time... I only have 24 hours every day, I do. And you can’t add more and more, we already manage large sections, so... Time.

Although some alternative explanations behind accidents can be found above, both interviewees put the largest emphasis on individual behaviours and attitudes in this context.

IP: No, I believe that the big thing for cutting down on accidents, that’s getting people to think things through and not to stress. And understand that things are allowed to take time.

One manager brings up a recent example. The implication here seems to be that operators have to have confidence in the fact that they can shut down production.

IP: The most recent serious accident I had, that was also at handover. Then a piece of scrap metal had gotten stuck behind a cutter. Two persons are sitting in that cabin, and then one goes out, and she tells her colleague that ‘Now I’m going behind the cutter to pull scrap metal, because a piece of scrap is stuck’. And then there was a hand-over, a lot of people enter the cabin, and she who sits in the cabin talks to them and then she presses the button, [so] that the plate rolls through anyway [...] Now the plate struck this stick she was using to pull scrap and the stick hit her thighs, but if she would have fallen down or something, the plate could have cut her in half. It happened at shift change, there was stress, they wanted to do a quick hand-over [...]. Very hard to know what you should do. But I think that it takes a while, you simply have to repeat that you shouldn’t stress at these occasions, instead we shut down.

There are few suggestions as to how this safety thinking is to be acquired. According to one interviewee, it is primarily important for managers to be active in the promoting of safety.

IP: I believe that one of the most important things here is to be really clear that safety comes first, so to speak. That safety... You should never take any chances, you shouldn’t stress, you shouldn’t... You should know how the machine works. Like this thing, where the piece of steel had jammed, a piece of steel jamming the cutter, that it’s under pressure. It’s under pressure, you should always...

Continuing, this is also a matter of forming the early conceptions of new employees.
IP: I think it’s very important, when we take in new people, when we hire new employees and summer substitutes, that you hammer in this safety thing, that there’s no way that you put safety aside for the sake of production. I think so, that that’s the way to go. That we have to spend more time on introduction.

The other section manager connects stress to competence and training, an area where she sees room for improvement.

IP: Then I would like to put more efforts on training. That they receive their competence and don’t become stressed by time pressure, when they have to train for heavy positions. There I’d like to... And training, I mean, there’s... Well, we said that it’s hard to build a mini furnace and try and see what happens, but... We would need other types of training on the side.

In contrast to steel mill operators, asking rolling mill workers about the causes behind common accidents reveals a clear focus on individual factors. Firstly, there are several comments suggesting that injuries caused by falling, tripping, crushing etc. are inherent to this type of operations.

SB: Why do these things happen you think?

IP: We’re in an industry.

SB: And what are things like in an industry?

IP: We don’t have level office floors everywhere.

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SB: Why do these things happen, in your opinion?

IP: We work with steel and heavy stuff. Weird lifting, and well... Like that, you’re trying to lift stuff and so on. We work with moving objects where there are large, you know, two tons of plate moving along.

SB: Are injuries unavoidable then?

IP: Yes it’s unavoidable, but you can probably get rid of a lot of them. But unavoidable, because people will trip in the stairs, that’s the way it is. You can’t get away from it.

When more direct causes are touched on, most interviewees centre on different weaknesses or malpractices of the individual operator. In some cases this is described as outright clumsiness or awkwardness.

SB: You have to think about what’s behind it?

IP: Well, some aren’t as clumsy as other people.

Other persons are more specific, trying to define scenarios or typical actions.

SB: Why do these things happen?

IP: You’re simply not keeping track of things, you’re looking somewhere else.
SB: Attention in some way?

IP: Yes.

SB: But what can affect your attention?

IP: Well damn, I don’t think so, you should be on it really. It may be if you’re driving the crane and you have to look up on the crane, [then] take a step... But you should look where you’re going, actually.

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IP: You may trip, you may... Somebody may drop a plate pretty close to you if you happen to be standing in the wrong place, things like that. But most of the time you have yourself to blame, if you’re standing too close when somebody drops a plate, but...

SB: But why are you standing too close?

IP: Because you forget where you are, in the end.

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IP: I don’t know... I guess it’s people who are mindless, things like that, because we drive... There are big cranes lifting stuff out here. A lot of stuff like that, that people aren’t alert. They may walk under a hanging load and so on, things like that.

Some persons seem to touch on an attitude of complacency.

SB: Why do you do those things?

IP: No idea, it’s... You don’t think about it, you’re used to that ‘I’m walking here’, and then you just walk. Then it doesn’t matter if there’s a crane hanging there or not.

SB: Everybody values his life, right?

IP: No well, it’s probably negligence like that. That you don’t think about it. It’s an old habit that ‘I can walk here, this is a walking lane’.

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IP: A personal reflection may be that they think that everything is safe. ‘It’s safe here, right? Nothing can go wrong here, can it?’ That they have relaxed a bit, and [I] say that ‘You have to be aware that a lot of things can still happen, so you shouldn’t trust that everything is...’

The fact that not even set safety structures like separate walking lanes guarantee safety, e.g. from moving cranes, also relates to sub-contractor workers.

IP: And then there’s a lot of uncertainty, that people who don’t know... That somebody comes from outside, who knows that ‘We’re working here, we’re allowed to walk here’. They don’t know that they’re supposed to stop if a crane comes, you know.

SB: Just because you’re walking in a walking lane, you can’t take your safety for granted?
IP: Yes, yes, absolutely. You kind of run stuff everywhere here.

Another variant of the complacency theme may be seen in talk about a kind of blindness.

IP: Yes, but you also become blind to things. I mean, I didn’t think that a year ago, I thought ‘I will always have respect for all this’, and now it’s ‘Yeah it’s a crane, so what?’. That’s the way it gets.

One person, however, connects this type of individual behaviour to fatigue and, more specifically, shift work.

SB: Why do these things happen?

IP: Tiredness, lacking concentration, that you’re not concentrated, you… But it’s like I say, you’re here at night, maybe you haven’t slept enough and...

SB: It’s heavy working the night shift?

IP: Yes, yes. It’s enough to... Then things might happen.

SB: But you don’t talk as much about this?

IP: No, no you don’t.

SB: There’s a lot of talk about safety equipment?

IP: Yes, I have to say so. Then I don’t know if you… Maybe some people think that ‘If you’re so damn tired maybe you shouldn’t work here at the mill’.

Some other issues are connected to training and procedures, primarily reported by maintenance personnel. The safety of these workers is highly influenced by the technical competence of regular production staff, and in particular, whether the “Break & Lock”-procedure is used properly. In many cases, according to one interviewee, “Break & Lock”-boards are neglected, and there is no set person responsible for their upkeep.

The way ahead

According to corporate upper management, one of the foremost ambitions of current safety work is to reach a higher level of uniformity between different plants. This may have to do with methods for risk analysis or rules concerning sub-contracting and visitors.

IP: But, if you will, a big portion of this role is about us learning from each other, finding mutual… If you will, best common practices, and I would like to reach that. I would say that’s my goal.

Locally, considerable differences can be found between the steel mill and the rolling mill, pertaining to both safety management and organizational hierarchy. These facilities are largely autonomous, even though there have been attempts to develop standards for safety work. A representative of local upper management comments on this.

SB: Do you review their operations?
IP: No, I wouldn’t say we do that. That is, we do follow-ups. We probably haven’t had the time for it, but the things we do follow up on, that’s most often whether they have carried out what they have said to the authorities, that they’re following the law, follow legal demands, reviews...

SB: But [do you perform] any comparisons, ‘They’re working like this, they’re working like that, what does that mean?’?

IP: No, well that is, if we have the time we do it, if we see something. But that is, so to say... Our way [of doing it] is so to speak that if something like that emerges, then we send out a form, and after that we hope that everybody will think ‘Oh yes, I’m going to read this!’. And it’s not many, say ten to fifteen of those every year that are issued. And there’s probably much more to learn in between [them] than that particular issue.

The intention of upper management is to create a positive safety culture, which they hope can become robust over time.

IP: And I want to believe, and that’s the experience of those who have come really far in this, that finally it becomes ingrained. It’s in the walls in a way that it actually... You know that it’s possible to work month in, month out, year in and out without accidents. And sure, there may be accidents in such an environment as well, there can always be, there is a human factor.

According to another person, there is often scepticism within the organization toward concepts that have not been developed internally, i.e. safety measures that are “not invented here”. Good ideas are adopted from other organizations and outside professionals, but such new concepts have sometimes been spoiled. SSAB may have gone too far in trying to remodel new concepts according to their own ideas about safety work. In other cases, new safety enhancing measures have not been given enough time or resources to reach their full effect.

IP: You have no rational [arguments] against it, but you end up with ‘Our operations are so very special, so I mean that we can’t do it exactly the same way, we just can’t’. And safety is not a unique domain in that respect, but sadly it also affects that area. We find it very hard, I would say, to adapt a good idea without tweaking it and sometimes distorting it as well.

SB: One example may be SSAB One? Now you’ve gone back and are doing it the way it was intended?

IP: That’s the ambition, but that’s also a bit typical for SSAB. I mean, we present an idea and then we meet some resistance. And then we don’t put our feet down properly, instead we start hesitating a bit, and ‘Well we can’t just enforce things’.

This person hopes that a clear management attitude to safety issues will encourage employees at other levels within the organization to achieve the right “mind-set”.

IP: And it’s everything from what we in the management say and show, to larger assemblies. We have work environment days and we have lectures, and some kick-offs and new thinking in this [safety] work. But the most important part, still, is the daily grind. That you reach this culture where we who move about in different ways have this in our heads, when we’re out, when we meet people, when we’re out in production, or when we’re out travelling so that we travel safely, use our safety belts or whatever it may be.

SB: It’s an attitude in some way?
IP: It is, I come back to the mind-set issue, and as I said, as managers we have a greater responsibility and also greater possibilities of making ourselves heard in this you know, because we have better access to these channels like Steelnet, and employee papers and large management meetings and things like that.

The same person states that the organization may have to introduce more severe consequences for operators that do not follow safety rules, regulations and procedures.

SB: What’s your strategy in this work, because I believe it’s fairly new?

IP: Yes, well this final touch I would say is fairly new, and unfortunately, it’s...

SB: The work on attitudes?

IP: The work around attitudes, to really get at it. And we have to, now we have to start being a bit more... Show it more. We had talked health-safety, it had been the first slide at our presentations for quite some time you know, always a part of external presentations and of in-house management meetings, but from just being a picture and general comments to really take the next step... And that we don’t regard it as a temporary campaign either, because naturally, we can print some posters, we can do some stuff, and I’m sure that you should just to get some spring to it, but... [...] It has to start with management, but you also have to – that’s our philosophy anyway – appeal to the individual employee as well. Because we can’t think for them, we can’t follow their every step, you have an individual responsibility as well, and you have to take it. [...] If you’re not prepared to take it, despite having every chance to do it, then we’ve also said that we must dare to be the ones to say ‘We’re warning you’, and at a given time you have to say that ‘Then our roads must part, because you’ve chosen to work in another way than how SSAB thinks you should’.

**Differences between the facilities**

When local facility employees are asked about the most important ways of developing safety work, differences can be seen between the steel mill and the rolling mill. Although managers at the former do mention behaviour issues no real emphasis is placed on it. Instead, managers talk about new barriers, changes in work methods and attempts to lower the amount of dust within the facility. There is also explicit mention of improving feedback to operators in all safety matters. Steel mill operators describe similar factors. Here, many mention possible ways of improving personal safety equipment (PSU). Other comments concern the information flow within the plant, and giving operators more responsibility for training new employees. Only a work manager mentions the importance of safety thinking, especially stressing experience in this context.

SB: How do you maintain risk awareness then?

IP: You have to have respect for it. I’ve been working here for 40 years and so far I haven’t had any accidents, knock on wood. But you have to have respect for it. And we’ve seen a lot you know, so you know how dangerous it is. Unfortunately, now things have been going so good for a while, so these young [operators] don’t know the dangers of molten steel and water and...

SB: They don’t have the experience?

IP: No, so it might become a bit dangerous in that way too. So because of that you have to tell them how dangerous it is.
The issue of vigilance can, according to this person, be met through improved operator communication.

IP: It’s really much about your workmates, that they’re aware of...

SB: That you’re coordinated?

IP: Yes, a bit like that, and that you know a little about how the other person thinks. But at the same time, that you don’t take it for granted, because there’s so much, keeping your distance to...
A plate fell from a crane, two times three metres. How do you know when that’s going to happen? It was a fall of ten metres, it’ll slice you...

SB: It’s taxing to keep that kind of vigilance?

IP: You can’t cope with it, but you at least try to keep a bit of distance. There are cranes everywhere for example.

An operator from another section also comments on factors affecting attention.

IP: Also, something you may introduce, something they haven’t really stressed, it’s that you shouldn’t do too long work periods in the crane. We’ve tried to say that ‘Two hours is enough’, then you should come down and be relieved, because you become slower. The same air circulates in the crane cabin, it gets poorer and poorer. I mean, it’s only filtered, if you want new air you have to open the door.

SB: Like in an aircraft cabin?

IP: Yes, you may say that. For example. And that’s an even bigger reason to take this break, maybe move around for ten or fifteen minutes. Or change work task.

Possibly mirroring the widespread conception that most incidents and accidents can be explained by individual actions, many rolling mill interviewees return to behaviours and attitudes when talking about future safety work. One section manager echoes the above comment from upper management saying that it is important to discuss individual consequences in this context.

IP: And then I also believe that if there are persons who violate regulations, then it’s important to have an end-point, that maybe even relocation or something else. That this is something which the company believes is extremely important. And we have started doing that actually. It’s not long ago that I transferred a person who had switched a light gate off just to increase [production] flow. [...] And now I could do that because one person at the shift team had written an incident report on her shutting the light gate down, and an incident like that, I haven’t had many of those during all these years. Of course there was an immediate conflict between these persons.

Consequently, when typical safety measures are mentioned, comments revolve around barriers and behavioural regulations.

SB: Do you perform any analysis of accidents like those [from tripping etc.]?

IP: No, you don’t really do an analysis, it may be that we bring the case up in our group, if it’s tripping or falling or something, well, ‘What can we do to avoid tripping’ or something. ‘Well,
there’s a big hole in the floor’, ‘Well fill it up then’. Or if something sharp’s sticking out, that scrapes you, then we have to remove this sharp object. Of course.

.........

IP: On this machine we’ve put a scanner that senses all the way around. If somebody comes it stops a few metres away. ‘A laser scanner will be implemented 6&4’. [...] And then there’s the person who almost got hit by a cutting steel. And then we simply wrote that ’Before you go under the steel you are to make sure that it’s not under pressure, that there’s no pressure on it’. [...] This was fairly serious, because a person could have been hit by a plate behind the cutter. And so we had this, ‘State measure that prevent repeated injury’, ‘We will block off the stairway at Cutter 1, south and north side, with a chain, and post work instructions, what to do if you need to go behind the cutter’.

Comments from rolling mill operators typically reflect the above conceptions around accident causation. A majority of these persons stress different varieties of “safety thinking”, such as “thinking about safety”, “being vigilant” or “keeping a good attitude”.

IP: It’s to get it into everybody’s head that safety comes first. That everybody should think about safety.

SB: And how do you do that?

IP: Well, think before you act, that’s the most important thing.

.........

IP: Simply being on top of things all the time, I would say is most important.

SB: Attention?

IP: Attention. That you don’t do something stupid.

.........

IP: As a matter of fact we have to think about what we’re doing ourselves, before we do it.

.........

IP: Either equipment, but then it’s much about getting people to be more careful. Think before you act is a really good thing if you can hammer it in a bit more, so that people really...

.........

IP: We’re grown people working here, and then you have to have a safety thinking of your own.

SB: That’s the thing, in your opinion, your own..?

IP: Yes, yes, that’s where everything lies really, that every person is supposed to think safely. And [that you] shouldn’t have to be told from above, that these are obvious things.
Other comments suggest that attitudes are at the core of the problem, and that poor safety related attitudes stem from ignorance, e.g. poor technical competence. Another person connects poor attitudes to macho behaviour.

IP: Guys or men have to have a tougher attitude. That you have an attitude, that you’re a bit... That you’re supposed to be more daring perhaps. And sure, that’s the way it becomes in a more... Male dominated [environment], or how should I put it?

Beyond the behaviour of the individual, different types of barriers are mentioned in the bulk of remaining answers. In particular, the newly installed light gates receive many positive comments. These gates are meant to prevent operators from walking on live conveyors and they thereby mediate a conflict between production and safety. In the past, it has been possible to save some time by not breaking power to the conveyors when stepping onto them. Now, the crossing of a light beam breaks power automatically, thus leaving no room for discussion in every particular case. However, it also becomes clear that the gates can be overridden, and that this has happened during the time of their implementation.

**The 30 second analysis**

A large portion of interviewee answers around accident causation has to do with “behaviours” and a lack of “safety thinking”. Few persons, however, hint to how such individual features are to be cultivated within the workforce. One actual attempt is the widespread campaign for the “30 second analysis”. This safety measure is based on a check-list which employees are supposed to utilize before undertaking certain tasks. One person from corporate upper management puts a great emphasis on this procedure.

IP: It’s [making] this, to do these 30 seconds, or if it’s only ten seconds of risk analysis, a natural part of your way of thinking. I sometimes think, to give an example from my own workday, that if I’m holding a presentation... [...] When I go up on that stage I’m supposed to pull off my presentation, and after that I’m supposed to go down from there. And I’m sitting close to the middle. A stage is not that high, maybe 40 50 centimetres high. Then, do I choose to jump off the stage directly in front of my chair, or do I choose to walk over and take the stairs? And of course, if I do even a ten second analysis I’ll reach the conclusion that there’s much less risk going down the stairs than jumping off. While I think that it’s too often in our nature to jump there.

On the other hand, two local managers are unsure about its usage.

IP: We have that as well, yes. I don’t know if it’s, to what extent it has been used in practice.

.......... 

IP: We have this 30 second model where we say that if you’re doing something out of the ordinary, you’re supposed to look and go through parts of the shift team, what applies at that particular machine. ‘What can happen if we do this?’ But they don’t do that in production, it never happens.

Although there is a document guiding this activity, it is often understood as some sort of simple reflection, as stated by a rolling mill section manager.
IP: There’s no training in that way, we’ve more or less talked it through on a group meeting, a section meeting or something, that ‘Think about this before doing unusual jobs’. Common sense, I often say ‘You get far with common sense’.

Another section manager, however, knows of issues concerning this procedure.

IP: No it hasn’t, we never use it. It hasn’t become rooted because we haven’t argued very much for it, because ‘What the hell, we don’t have time for that, we’re rolling plate!’ you know [laughs]. Then, when you’re out in production, when should you reach for it? When should you use it?

The rule seems to be that the 30 second analysis should be applied when performing unusual tasks, but that limitation is apparently difficult to apply.

IP: I’ve showed it on safety group meetings and other places, but you don’t get any response from safety representatives or other people within the shift teams. ‘What the hell, are we supposed to use the 30 second analysis every time something happens? What, aren’t we supposed to roll plate, or what?’

This section manager can also think of situations where it is hard to determine whether the analysis should be performed or not.

IP: For example, if a plate gets stuck on a bed and you have to go there and use iron-bar levers, which is a fairly common way of having an accident, when you’re levering on plates. That happens daily, or daily, every week at least. Should you do it then or not? [...] It’s often that way with this safety business, a lot of stuff is developed and then it’s ignored, or sits in a binder.

![Figure 3. List to be carried during work, describing the 30 second analysis](image)

Most persons in the group of worker interviewees are unsure to how this regulation is to be applied, and what it actually covers. One person sees that over-use could be problematic.
IP: Yes, and that applies to tasks that you don’t normally do, otherwise it would have taken [too much] time. [...] If you get a new task, then you should sort of give it 30 seconds, if it’s safe, is there some protection, can we get protection, if it’s a new task. So we kind of have... There are routine guides for those things, but it’s kind of general.

Another person has a differing view.

IP: There was a lot of talk about that, there are posters everywhere about the 30 seconds, and it’s a very nice idea. Then I can only say that, personally, the way I am, maybe I don’t stop that much to think about it. But normally when you’ve been working a while, you think about the risk that exists, and you know what might happen. [...] But when you have production like this, there’s a bit of panic when something actually happens, so it’s hard to stop like that.

Other comments also give the impression that this regulation is difficult to implement.

IP: That’s hard, I think. I don’t know really, if you think it’s a great risk, then you may do something preventive.

SB: There is this 30 second analysis?

IP: I think that varies from person to person, it differs.

.......... IP: Yes, one campaign has been the Three Second Regulation [sic!]. That you don’t just rush off, but instead take it a bit easier. I myself have been bad at applying the three second rule. They’ve said that “Mind the three second rule”, but it hasn’t stuck. It has to stick before you can make a practice out of it.

Operator responses are largely very similar at the rolling mill. Some persons state that a risk assessment should always be made prior to a work task, but that it is not a structured activity.

SB: Do you use the 30 second analysis?

IP: Well, I think so. I mean, I haven’t read about it that much, it’s more that I stop and say ‘Wait a minute, I have to think about how I’m going to...’. Then I don’t know if I’m using the 30 second rule, but it can be good to stop for a bit before doing something.

.......... IP: Then you should always do a risk assessment before doing something.

SB: The 30 second analysis? Is that something you’ve been trained to do?

IP: It’s something they’ve told us to do, but…

SB: It’s not a checklist?

IP: No, you’re supposed to stop and think for 30 second before doing something, it’s like... It’s what they... But...
Although this last person says that the 30 second analysis should always be used, he himself does not.

SB: Is it realistic? Do you do it?
IP: Some do.
SB: Why do they do it?
IP: I don’t know. I don’t think that much, I simply act.

Several persons promote experience and “common sense” as an alternative to using the 30 second analysis. In some cases this particular procedure is not even known.

SB: Is that like the 30 second analysis?
IP: No, I don’t know what that is.
SB: You haven’t heard about it?
IP: Is it that you’re supposed to wait for 30 seconds and think?
SB: Yes, I believe that’s the thought.
IP: No, I haven’t heard that.

...........

SB: Do you perform any risk assessment before work?
IP: No, I don’t know really.
SB: Not in a structured way, anyway?
IP: No, I can’t say that.

[...]
SB: You don’t receive any training in risk assessment, what to look for and..?
IP: No, I can’t say that.

Other persons are familiar with the 30 second analysis, but nevertheless have found no real use for it. Instead, these people stress experience and reliance on one’s workmates.

IP: Well you’re supposed to do a 30 second risk assessment. You learned that at a course you attend when you’re new. [...] You’re meant to stop and look ’What could happen?’.

SB: Do you do it?
IP: No, I mean, not... I never think about that really. I guess you think about what risks [there are], when you out there. It’s not that you stop and ‘OK, this can happen there’.
SB: You learn as you go?

IP: Well of course you learn. And then, you get told a lot beforehand that ‘Now we’re doing this, and this may be dangerous’. People who have been working a while tell you those things.

...........

SB: So it depends very much on experience?

IP: Oh yes. Especially those who have been working for a long time, they will see directly that ‘Don’t do that, god damn it’. So it’s OK.

Finally, one safety representative regards this initiative in a positive manner. According to him, however, although the analysis is not structured, it should always be used.

SB: It’s not a checklist?

IP: No, you’re supposed to think things through, when you do something [...].

SB: How often do you do it?

IP: It should be used in all things you do really, all tasks you perform should at least be preceded by thinking that ‘OK, all is clear, it’s totally risk free to do this now’.

**Positive behaviours**

In the above discourse on behaviours and attitudes, it appears that interviewees exclusively refer to negative traits or actions. A person from steel mill upper management does tell of some general attempts to introduce a more positive attitude to safety work.

SB: Do you reward positive behaviour in some way?

IP: Not to any larger extent I think. I usually try to do it. That was an insight from reading some of this safety literature, that it has a better effect than negative [feedback]. So, I usually try to use a positive stroke.

When steel mill operators are asked whether positive safety related behaviours are acknowledged or even rewarded, answers are scattered. A few are mildly positive.

SB: Are you ever rewarded for doing things right [safety wise]?

IP: Yes, well I think that you... If people see that you’ve done right. Well, yes, you do get feedback on that.

...........

IP: That’s what’s so good about these K-norms now, that you have something to rely on, and [where you] can actually show on paper that we’re right in doing this. Then it’s more ‘Yes, well, it’s a good thing that you didn’t bring it [a ladle] up’ instead of ‘You should have brought it up, because now we’ll fall behind’.

Two other persons, however, suspect that only actions related to production are commended.
IP: You’re rewarded if you do good in production. It’s not like “How good it was of you to put that tape up!”. But if you have suggestions, I would think that you would probably be commended for it. But not if you perform a safety... They take for granted that we do that every day.

SB: Are you rewarded for positive actions in safety work?

IP: I think that you’ve gotten something for so-called negative reports too, little things, cinema tickets?

SB: When you see a problem?

IP: No, problems, I mean when you reported incidents for example, in the past. It hasn’t been very common to report incidents before. But I don’t know, I really don’t know. Maybe it has to be related to production for you to be rewarded.

Observed positive events or behaviours within safety work are not reported through MIA, and at both facilities, the systems for making suggestions appear to be production-centred. Interviewees also tell of instances when production enhancing suggestions have been rewarded. Positive remarks are sometimes given within the work team, but other comments reveal a macho culture in this context.

SB: Do you receive positive feedback when you do something good?

IP: Yes, by your workmates. Yes, you may get that. If you come to think of something that makes things more safe.

IP: Because I believe that some people think, maybe, if it’s your workmates... That you’re only a little coward in a way. A bit like that, that you... You should have the guts, these are big things, you ought to dare a bit, I think so.

Several other comments do suggest that some managers attempt to commend positive behaviours, but that such instances are rare.

IP: When you do something good safety-wise, is it acknowledged?

SB: No, it’s... Well, your boss pats you on your head and says ‘Well done’, that’s what happens. And if you write enough incident reports you can win a bicycle. Which made people write incident reports on everything for a while. That wasn’t very meaningful perhaps.

IP: It’s nothing extreme, but that happens as well. ‘Good thing that you locked there’ or... But really, it’s part of the job, that you should do this safety stuff, breaking and locking before you enter a facility. It’s something that... It’s part of the job and you shouldn’t need to...
Summary

Under each of the original categories of analysis, certain themes have been brought forward and explored in depth. This section will attempt to provide an overview, where the different facets of analysis are combined and transformed into a summarized, qualitative description of the identified safety culture and its local variants.

The commitment to safety of SSAB management is wide-spread and clearly stated, not least through a strong feeling of responsibility for workplace safety. Middle management also reports an economical commitment to safety, manifesting in increased safety resources. Expressing this commitment, however, is inhibited by difficulties in maintaining a management presence at the work floor. Interviews signal that more work tasks could be delegated. This would allow managers more time at the work floor and may increase worker involvement in safety activities. Lacking manager presence appears to colour operator attitudes on the subject. Interviewed employees have low faith in upper management commitment and are sceptical to the stated prioritization of safety over productivity. Trade-off situations still occur, and one-sided production talk is perceived to send an implicit message of management’s true priorities. At the rolling mill, these situations become particularly difficult at times when managers are absent. The steel mill has initiated a conflict inventory, attempting to uncover and process all perceived clashes between safety and productivity. This is very positive, but the amount of worker participation in this activity is unknown, and similar activities have not been found at the rolling mill.

Steel mill work managers have emerged as a potential resource in the relations between upper management and the work force. Their continued training could improve this matter significantly. At the rolling mill, however, managers are allowed even less time at the work floor. Safety representatives, who could compensate for this, do not always have the authority or competence to enforce safety when managers are absent. Lacking communications between the workforce and upper management are yet again manifested in general negative attitudes to central safety initiatives. Many operators have a low faith in the process understanding of upper management, largely because of crudely designed central campaigns where the needs of sharp-end employees have not been taken into proper consideration, or where visions have been presented without information on how to reach them. Sharp-end involvement in both design and implementation of these initiatives appear to have been lacking. The high workload of managers has made Steelnet into the primary channel of communication between managers and the workforce, but quality of communication often appears to be low. Firstly, communication is largely unidirectional. Secondly, operators report that the intranet is difficult to navigate, contains vast depths of information and is not equally accessible for all workers. Some comments suggest that local intranet pages may have become particularly messy.

Workers at both facilities receive training in many forms, from introductory activities to courses that are directed at specific work tasks or hazards. Some activities are recurring, although many operators are uncertain to their frequency. Safety drills are performed to some extent, but operators have few, if any experiences of it. It appears that drills do not commonly include sub-contractors or summer substitutes, which could naturally cause problems in the event of an actual emergency. The extent of joint training or training using realistic scenarios
appears to be limited. Continuing, it is not clear whether safety training is carried out when new technology, work tasks, methods or procedures are implemented. There are some positive examples of initiatives to give workers responsibility for training of new employees, but the extent of this is unknown. A general conception concerning training is that many activities poorly mirror the realities of day-to-day work, and that few workplace structures are in place to reinforce what has been learnt during training. Similarly, managers do not appear to receive safety management training specifically tailored to their individual work roles.

Both facilities engage workers in various activities and projects, such as safety rounds, safety committee meetings, risk analyses, technical implementations, upkeep and PSU maintenance. It is however clear that many of these activities are primarily attended by proxies, i.e. safety and group representatives, and operator perceptions of involvement are often negative. In theory, many opportunities exist where workers may discuss safety matters, but the focus of activities like morning meetings or shift meetings varies between sections and workplaces. Involvement does not seem to be consistent for procurement of equipment, design of work tasks, procedures, equipment, training or communication. Nor do workers appear to be consistently involved in work planning, manning, goal setting or timetabling. Lacking involvement appears to have produced monotonous, unchallenging work tasks in some cases. At the steel mill, macho attitudes are typical in connection to common hazards. Both facilities employ automation for certain tasks, something that appears to be increasing. This, together with lacking responsibility for many tasks, could also produce a risk for skill loss and a further erosion of worker professionalism.

Horizontal communication within work teams or between sections or work places varies greatly, and rarely appears to be specifically directed at safety matters. Contacts are often maintained through representation and quality of communication may therefore be affected by the nature of individual representatives. Similarly, the focus on safety matters at assemblies appears to vary between work teams, and handovers vary in form and content. In some cases, workers take the initiative to engage in more informal communication. The two facilities are often described as almost completely isolated from each other. Managements of the neighbouring plants do meet, but mainly to discuss production matters. There are also differences in the communication structures of the two facilities which could affect information dissemination, for example whether e-mail addresses are shared or private. Great efforts have been made to increase reporting, and operator attitudes to this activity are mostly positive. There is no apparent fear of personal consequences connected to reporting. Issues do exist however, which are related to the definition of incidents and, by extension, to normalization of certain types of injuries. This is particularly evident at the steel mill, where many hold that minor burns are inherent to the working environment. Workers also find it hard to reach beyond seemingly simple explanations to common incidents such as tripping or falling. A new system for reporting has recently been implemented but the above issues remain, and there is an uncertainty around some of its new features. At the rolling mill, informal channels of communication exist which could compete with formal reporting. Feedback on accidents is typically speedy, but several negative comments are made around feedback on reported incidents or worker suggestions, which is deemed infrequent, inconsistent and poorly circulated. Suggestion systems do exist, but are largely perceived as production-centred. Finally, worker interaction with sub-contractor employees does not
appear to be structured in a wide-spread manner. Several operators talk of risks surrounding outside employees, who may be hard to keep track of during the workday.

SSAB has spent a lot of resources on the development of pro-active safety work. SSAB One has introduced structured upkeep and employee involvement through TPU work, and personnel at both facilities now engage in risk analyses, regular control rounds and reporting activities. Although this is positive, operator involvement appears to be limited and many activities have a technological or production-centred focus. It is unclear whether risk analyses are performed consistently and with worker involvement, in cases of implementation or revision of technology, equipment, procedures, communication, work tasks or work patterns. There is also reason to question the core assumptions behind safety management and analyses of risks and accidents. Currently, pro-active safety work throughout the organization focuses on the behaviours and attitudes of individuals rather than on improving safety system structures. This is particularly prominent at the rolling mill, and this is also where similar factors are commonly used to explain present-day accidents. It is also unclear whether the safety impact of features like communication, methods of training, worker involvement or minor incidents is fully taken into account. Activities targeting perceived negative attitudes and behaviours, like general safety information, “safety thinking” initiatives and the 30 second analysis, appear to have had a very limited impact. Furthermore, although behaviours are prioritized in safety work, actions at the blunt end of the organization do not appear to have been equally scrutinized. Only informal structures exist to gather and process positive experiences from safety work. Instead, positive feedback is mainly given on production related actions or events.

In summary, the safety culture observed at SSAB displays many positive traits, but it is not homogeneous. Inadequate vertical interaction, lacking worker involvement and features of the specific workplaces have given rise to negative subcultural expressions. Attitudes and perceptions are shaped by the circumstances of sharp-end operations, reflecting certain areas of weakness. Each analytical category has revealed many areas of potential development. In the following chapter, these opportunities will be discussed.
Discussion

Analysis has uncovered a number of themes emanating from the original categories of Management Factors, Education & Training, Communication, Democracy and Focus of Safety Work. Some of them follow the lines of common safety culture issues, others have emerged during interviews. In this chapter, the most salient issues will be brought up for discussion in the light of research described initially. Results of the following discussion will be used to form a list, in a more creative manner, which could be used as a point of departure for future safety development work. Prior to the discussion of results, some topics will be brought up that revolve around more general safety culture issues.

Research Topics

While modern safety culture research acknowledges the interplay between individual, organizational and contextual factors, the systems view on safety can be used to explain complex interaction in greater depth. An organization’s culture is typically not homogeneous, as noted by Haukelid (2008), and hierarchical divides may reinforce sub-cultures. Haukelid makes the remark that these sub-cultures may work to balance pressures from above, functioning as counter-cultures in organizations with poor cross-scale interaction. But differing cultures may also increase differences in process understanding between floor level employees and office personnel. In a complex system, every sharp end has its blunt end (Reason, 1990). Although actions at the floor level may seem to be root causes in incidents or accidents, sharp end employees can only play the cards dealt by upper organizational layers. Varying understandings of the work process may make it less likely that safety management and high-level planning matches the needs of the sharp end.

In connection to the discussion of cross-scale relations, cognitive systems theory also deals with the issue of systems boundaries. Complex systems are often tightly coupled and events or actions may propagate and combine with far-reaching effects for safety. Rollenhagen (2010) sees a growing bias within the research community to concentrate on the individual’s representation of safety culture, her beliefs, morals, values, attitudes and behaviour. In his view, the research of Haukelid and Antonsen implies that attention should be shifted more toward the design of workplaces. From a cognitive science point of view however, it makes little sense to discuss thinking, behaviour and environment as discrete entities. Drawing on the reasoning outlined in the background chapter, human cognition can never be fully understood without considering the environment in which our activities take place (Hollan, Hutchins & Kirsh, 2000). Conversely, work environments with their multitudes of artifacts can never be understood without considering their connection to human thinking – whether they support or obstruct cognitive processes, and how the characteristics of situated cognition can be gleaned from the configuration of peoples’ surroundings. System functions run into problems when their interaction is flawed (Hollnagel, Woods & Leveson, 2006). It is not a question of choosing to focus on one or the other, technology or people, because in a way there is only one. Through culture we develop entrenched ways of handling problems in interaction, giving rise to sub-cultures in relation to differing work contexts (Rollenhagen,
Fusing the individual with her context has implications for the assessment of safety culture.

Good safety performance depends on efficient communication, interaction and a pro-active, non-simplistic view on incident causality (Hollnagel & Woods, 2005). With systems theory as a background, it becomes clear that safety culture must be assessed both horizontally and vertically, taking great care to investigate interaction effects between cultural traits of different organizational instances. Collaborative activities may prove to have great consequences for the impact of safety activities, and by extension for safety culture. Because of that, psychological, behavioural and situational factors should not be assessed in isolation. The ways in which these factors interact should be given equal attention, because cognition and environment are in many ways inseparable (Hollan, Hutchins & Kirsh, 2000). The opposite of this paradigm, focusing on individual behaviours and barriers, still dominates some strands of safety culture research. Applying a systems view should create more comprehensive and sustainable functions for safety management. This should advance the forming of a positive, unified safety culture, given that cultures change slowly and demand solid, unerring contextual support. It is not enough to simply establish the existence of certain safety measures, as is often the case with safety management driven by legal demands. All safety management system functions must also be assessed for their structure as well as integration, making sure that they mirror a modern, systemic theory of safety.

Appraising this research area by ways of cognitive systems theory may also have consequences for the concept of safety culture itself. It has been argued above that diverse actions and events within the organization may have indirect effects on sharp-end safety. This study has identified several organizational traits which are not directly associated with safety work, but which nevertheless may have long term effects on safety outcomes. Some examples are organizational structure, democratic functions and flows of communication. Emerging patterns like these could be taken to support Antonsen’s view (2009), that safety culture has no real substance as an isolated concept. Reaching an understanding of how seemingly disparate organizational functions may interact to affect sharp-end safety is a challenge, and talk about safety culture as an isolated phenomenon may limit this discussion to the domain of traditional, barrier-based safety work. It could very well be argued that assessments like these should be directed at organizational culture in a broader sense.

Management commitment

No hesitation can be found in the verbal commitment to safety of SSAB management. Interviewees emphasize an attitude of caring, reminiscent of the ideas of Johnson (2007), calling for an empathic attitude to permeate all organizational activities. These persons have made the focus on safety into a practical communication policy and operator interviews suggest that the message has indeed been registered. However, worker statements also give that this message is not fully trusted.

Even though management’s commitment to safety is sincere, demonstrating such a commitment within an organization spanning thousands of employees is a difficult task. Researchers within the domain of safety culture (e.g. Nævestad, 2010) state that positive outcomes of an organization’s safety system depend heavily on a clear management presence.
at the workplace. In fact, not only do managers have to be present in a discourse around safety. They also have to be perceived to be present, which means that formal delegation of responsibility is not enough.

Maintaining a work floor presence is a daily struggle for many SSAB managers. Given the slim chances of visiting the sharp end of operations, management has instead chosen a hard line in the enforcement of both local and central safety campaigns, e.g. in the case of eye-protection regulations, and perhaps echoed in the Zero Tolerance initiative. But the difficulties of maintaining a presence have not only produced this hard line. Lacking presence is also what makes it problematic. At the Oxelösund facility, nothing suggests that central initiatives are routinely anchored within the workforce, adapting them to the realities of work practicalities, nor that any activities are normally arranged to discuss implementation with floor level employees. Both of these facts may be considered a testament to the failing communication between hierarchical levels within the organization. When the sender is perceived as anonymous and detached from day-to-day work conditions, the message receives an unfavourable interpretation. In some instances, central initiatives may even be taken for attempts to shift responsibility in safety matters. This will appear more clearly in the latter section on perceived management understanding. Propaganda has precluded discussion and practical guidance, making some of these phrases sound hollow. This problem is further aggravated by the fact that upper management initiatives live on the good will of local financing. In this respect, upper management representatives are sometimes reduced to salesmen of their safety visions, and actual implementation may fall far from what was intended in the first place.

**Vertical communication**

Management has few chances to visit the work floor, although perhaps Oxelösund steel mill management makes out an exception. Even here, however, managers rely heavily on Steelnet to maintain communications with the workforce. Zohar (1980) early made the observation that frequent contact between workers and managers is a fundamental prerequisite for the development of a positive safety culture, something that has later been confirmed by many others (e.g. recent examples in Antonsen, 2009; Nævestad, 2010; Guldenmund & van Loenhout, 2010). In the light of this, it is striking that the main line of communication, i.e. Steelnet, receives such poor remarks by operators. In many cases, design appears to be lacking. Floor level employees complain over cluttered layouts and vast depths of information. Furthermore, accessibility sometimes depends on the work role of each individual worker. Most importantly, perhaps, communication is largely perceived as unidirectional. There have been attempts to use Steelnet for direct, bidirectional communication (e.g. through the use of chat-rooms), but comments suggest that this has not been very successful.

In relation to communication, some interesting differences exist between the two Oxelösund facilities. Firstly, steel mill workers have e-mail addresses of their own. This makes it easier to catch up on recent events after being away from the workplace. At the rolling mill, addresses are shared, which means that workers returning to the workplace may have a harder time keeping track of recent communications from management. It should also
be noted that although e-mail is described as an important channel for safety related communications, it is not clear whether summer substitutes have the same access to this information source. Secondly, workers at the rolling mill use a so called log book for certain types of communication, a more informal alternative to e-mail contacts or reporting. Because of organizational structure, rolling mill managers find it even more challenging than their steel mill counterparts to maintain a presence at the work floor. The development of new communication channels could be seen as a product of that. Although this may be a positive thing, it should be noted that log book entries do not demand the same handling as MIA reports, which means that managers are not in the same way obliged to take them into consideration.

More seriously, the reported lack of manager presence at the rolling mill seems to have produced certain informal patterns of worker communication. When no managers are around, workers make their own agreements and decisions, sometimes with regard to safety-productivity trade-offs. In the worst case scenario, this means that process understanding of managers and workers start to diverge, undermining the ability to make good decisions in safety management.

A representative of local upper management makes an insightful remark, saying that some managers appear to feel that they have fulfilled their obligation of information after making Steelnet publications. This hints to an understanding that actual communication is a two-way process, where quality is determined by the answer a message receives. No comments suggest that vertical communication through Steelnet has been evaluated. If a message is to be appreciated, the receiver has to feel that it applies to his or her context and conditions. Seeing to this, in turn, becomes increasingly more difficult the more distance there is between sender and receiver. When upper management chooses to communicate a new safety initiative, local structures must exist where workers can become involved in the adaptation process. Ideally, upper management can even meet workers eye-to-eye, comparing their visions to the reported conditions of sharp-end operations. Local managers, on the other hand, must make sincere attempts to increase their time at the work floor. Perhaps more importantly, circumstances must allow them to maintain such a presence.

The topic of worker-manager communication is particularly important in relation to situations of safety-productivity trade-off. Workers are vulnerable in these situations, because they are likely to know that productivity ultimately decides whether they get to keep their jobs. All interviewees who touch on this subject report that presently, productivity is never explicitly prioritized over safety. On the other hand, situations of conflict still arise. For example, communication focusing solely on production matters may be interpreted as an implicit prioritization. Haukelid (2008) emphasizes the risks of double communications, saying that this may undermine a safety-centred message from management. By analogy, one instance of infidelity is normally enough to damage a relationship severely.

Showing real commitment, then, means management consistently putting its money where its mouth is. An interesting initiative with regard to this can be found at the steel mill. Local management has created a form of conflict inventory, trying to reveal and counter every situation where a negative trade-off has been made. Safety culture research (e.g. Vredenburgh, 2002) demonstrates that there is no given conflict between safety and productivity. Rather, the two often meet in terms of quality, stability and commitment. Given
proper worker involvement, conflict inventories could provide a powerful tool for worker-manager interaction.

Worker perceptions of management safety commitment are also shaped by more long-term organizational behaviour. In connection to safety-productivity trade-offs, upper management should ask themselves how the organization has reacted to financial fluctuations in the past, and whether such fluctuations have affected safety work. Because safety commitment is often understood as an economic commitment, maintaining safety in the face of economic challenges may have a far-reaching impact on safety culture.

Too much distance between managers and the workforce caters for negative interpretations of management’s actions and attitudes, but the fact that some managers only communicate in production matters does not necessarily have to do with attitudes. Instead, one-sided communication may very well be connected to manager workload. In the following section, this will be discussed in relation to delegation and training.

**Management structure and presence**

The amount of management presence at the work floor has to be regarded in relation to context, because in essence, the possibility for this depends on how management is structured. Many managers report that maintaining a presence is a constant struggle. At the same time, there are marked differences between the organizational structures of the steel mill and the rolling mill, likely colouring the results of this study.

At the steel mill, work managers have been appointed to follow the operator shift-cycle. Where workers previously had to rely on representation in their communication with management, every individual now has direct access to one of its representatives. Work managers are not uncontroversial, but most interviewees comment positively on their existence. Unlike group representatives, work managers hold greater authority and, at least in theory, should be able to communicate worker concerns more directly to upper management. This, in combination with the fact that they have been recruited from the ranks of workers, puts them in a privileged position to merge the process understanding of lower and upper organizational layers. It is the ambition of steel mill management to equip these new persons with the proper tools for safety management. Instead of micro-managing the minute details of day-to-day operations, they should be given the time and competence to engage in more creative forms of safety work. This process agrees strongly with safety culture research, where the mediating function of floor-level management is often emphasized (Flin, Mearns, O’Connor & Bryden, 2000; Gadd & Collins, 2002; Zohar & Luria, 2005; Guldenmund, 2007) and the power of safety leadership close to the organization’s sharp end (Kines, Andersen, Spangenberg, Mikkelsen, Dyreborg & Zohar, 2010). Empowering and training lower managers and supervisors have sometimes proven a key to safety work success (Guldenmund & van Loenhout, 2010). In addition, delegation will also produce involvement, something that will be further explored later.

In the continued design of the work manager role, steps may perhaps be taken to counter the impression that work managers are simply there to represent managerial authority, for example by pushing production. Also, some work manager comments suggest that contact with upper management is limited. To make the most of the democratic function of this group,
this is perhaps an area of improvement. The steel mill process of increasing delegation is positive and could likely be applied at other levels of the organization, but of course, delegation can only be taken so far without increasing resources.

No similar in-team management exists at the rolling mill. Workers instead rely on group representatives and safety representatives in their communications with upper management. Managers here find it hard to be physically present at the work floor, and in practice, this means that there is sometimes no higher authority to enforce the prioritization of safety. At night and during weekends, naturally, this situation is even more accentuated. Section managers report similar observations. For them, safety representatives provide an important support in many safety activities, but at the same time, the work role and competence of some representatives is questioned. Given this, more resources should perhaps be spent on the training and empowering of these persons. Doing so could make it possible to balance the lack of work-floor management, at least to some extent.

The newly appointed work managers are clearly in need of specialized training, but interviews have shown that this is also true for other managers. As Guldenmund (2007) points out, actors on different positions within the organization fulfil different, complementary roles in safety work. Judging from section manager comments, this means that different managers also have different needs. Johnson (2007) particularly stresses that managers must be able to coach their workforces in safety matters. That, in turn, naturally demands a strong safety competence. While it is positive if work managers become equipped with concrete tools of sharp-end safety management, the same should hold for managers at all levels. Doing so demands many investigative, specialized processes of work role design in close collaboration with actual managers, but the benefits could be substantial. Finally, safety culture research connects the size of an organization’s HSE department to its commitment to safety (Wu, Lin and Shiau, 2010). Some representatives of upper SSAB management have to assume the role of frontmen, researchers, developers, planners and salesmen, and should perhaps receive better support in these functions. In particular, this could help upper management to increase their sharp-end presence.

**Worker involvement**

Throughout the interviews, middle management reports a marked shift in the general safety management of SSAB, typically materializing in increased safety work resources. Great efforts have been made to develop a broad range or pro-active safety measures and activities. In the light of this, negative comments from worker interviewees (e.g. about central safety initiatives) may seem undeserving, but an explanation could be found under the topic of worker involvement and influence.

Many activities at both facilities appear to involve worker participation to some extent, but reports are inconsistent. TPU work allows operators to order their own safety equipment, but only some sections also practice worker involvement in equipment testing. According to management, projects for new technological implementations should always include participation by worker representatives, but few interviewees have any experience of this, which means that feedback to the work teams may be lacking. The design of work tasks, procedures, rules and regulations does not seem to involve participatory processes, with the
odd exception. Some work teams report an extensive influence over work planning and manning, while others claim to have no such freedom. Workers at the steel mill now carry out their own fire safety inspections. This example is salient, because the absolute majority of other activities only allow for involvement through representation. There are comments suggesting that some work tasks inherently allows for more leeway. The question is whether this is a fact or whether it is simply a commonly held conviction.

The focus on personal safety equipment sometimes appears to make for a monotonous management of work floor safety. Work managers, as well as rolling mill section managers, find it hard to reach beyond the constant reminding about safety equipment use. Consequently, the equipment itself and such reminders are what workers primarily associate with the increased focus on safety matters. While this will possibly be improved by renewing the work manager role, more benefits could be reached by more profound operator involvement in safety work.

Firstly, increased participation may mediate the fact that work managers are sometimes perceived as negative authorities. For example, Prussia, Brown and Willis (2003) note that worker-manager collaboration strengthens the bonds between organizational layers and helps mediate conflicts. When work teams engage in more safety activities together with their work managers, the result would likely be an increased impression of management commitment to safety. Continuing, utilizing sharp-end operators in the design of central safety initiatives will likely mean that the final product becomes better adapted to work floor needs. According to Haukelid (2008), safety initiatives may even be sabotaged if worker involvement is poor. Involving operators in design will avoid such problems. As a further consequence, final reception of the same initiatives is likely to be improved. When the same line of reasoning is applied to procedures and regulations, improved reception and user adaptation could also be expected to improve compliance. The steel mill has made the largest efforts around participation. It is possible that this can explain why workers here are more prone to emphasize their own responsibility for safety.

Antonsen (2009) describes increased worker involvement in terms of worker empowerment, where employees reach a kind of safety ownership through involvement. The logic behind this reasoning (also found in Zohar & Luria 2005, Larsson, Pousette & Törner 2008) is simply that you treasure what you yourself have been part in creating. Furthermore, increasing direct operator involvement in safety activities bypasses an inherent flaw in democracy through representation. When the latter type of involvement dominates, actual worker influence will be determined by the inclination of each individual representative to involve his or her work team actively. Formal structures of democracy are of little value if workers do not actually feel involved. Widespread participation will provide the broad mass of employees with diverse, positive experiences of safety work. That, over time, will shape safety culture.

Operator involvement in other areas, such as work planning, manning and work rotation, holds other possibilities. Some interviewees tell of work tasks that are monotonous and simplistic. Worker involvement in design processes could probably help this to some extent, but it may also be rewarding to think of other ways of job enrichment (Hackman & Oldham, 1976). According to researchers behind this idea, if a person feels that the work he carries out is valuable and has many opportunities of demonstrating his professionalism
during the workday, he will also perform better. Since this reasoning is deeply connected to attitudes, it is conceivable that positive feelings toward work in general would also affect commitment to work safety. When manager roles are re-designed, it may be wise to give operator work roles an equal treatment.

At both facilities, rules, regulations and compliance are common topics in the safety discourse. Management has chosen to stress individual operator behaviour in relation to rules and procedures, but this study has shown that existing guidelines are often under-developed. Hollnagel, Woods and Leveson (2006) state that neither strict procedures nor physical barriers can cover all possible incident states within a complex system. It may therefore be unrealistic to expect unproblematic compliance, which implies that something else has to fill the gaps. On the other hand, procedures may improve stability, providing a common ground for process understanding, allowing people to anticipate the actions of others (Rollenhagen, 2010).

Hollnagel et al. argue for solutions that allow for a requisite variety in the face of system disturbances. While static procedures may indeed inhibit the adaptive capacity of operators, a middle ground between freedom and regulation could perhaps be reached through increased employee involvement. If procedures were to be made into ever-evolving, collaborative projects shared by managers and operators, it may be possible to increase their quality and relevance, with increased compliance as a likely effect. An effective flow of communication, both horizontally and vertically, would allow operators to identify the need for different types of adaptations, while a consequently well-informed management would be able to meet their needs. The steel mill manager states that operators are nowadays allowed to deviate from procedures, as long as they tell their managers why. This attitude could go a long way in merging the process understanding of work floor employees and their managers, provided that larger groups of operators become involved in the design of shared artifacts.

**Training and work floor realities**

Some operator interviewees report an almost overwhelming amount of training initiatives, from introduction on to a broad range of recurring activities. At the same time, few of them are able to connect the content of training to every-day work conditions, and employees on all level stress actual experience rather than theoretical studies of safety. But why is there so much uncertainty around the frequency of many training activities? Do summer substitutes and sub-contractor workers have knowledge about emergency evacuation procedures? Will a sub-contractor worker inside a machine be remembered if there is a fire? Will that person know what to do? And what could the increase in employee rotation carry with it, given how infrequent certain training is?

Managers asked about training at the employee level typically respond that all legal obligations have been fulfilled. Indeed, this type of reasoning could be expected to create infrequent, big-bang initiatives of training, where management may easily confirm that all required information has been transferred to a sufficiently large group of employees. It is also a fact that much safety work is carried out through representation, which means that many training initiatives will only reach safety representatives. Work team benefits, then, depend on the skill of every representative to communicate his or her experiences.
Some comments suggest that it is very difficult to spare work teams that have to leave their stations in order to receive training. Similar problems are reported in relation to safety drills, where the judged gravity of an alarm is weighed against the negative consequences of disrupting the steel making process. When people return from training, few structures at the workplace mirror and activate what has been learnt. But the answer to these problems could reside in the interviewees’ own comments about actual work experience. Instead of removing employees to conduct centralized, theoretical training, one could explore the possibility of making the actual work floor into more of a classroom.

Training which is situated and context sensitive may uncover risks and situations that are difficult to imagine in theory, and could also fuel discussions around safety. This would balance the current situation, where work managers feel that they are mainly passing on information from upper management to their work teams. Situated training should include groups of people that interact during daily operations, making sure to uncover problems through live exercises, drills or scenario-based learning. There is also reason to believe that context-sensitive training could equip workers with a better ability to identify and manage risks in the normal flow of work. This could counter current worker impressions of training, i.e. hearing the same message repeated time and again, and provide a powerful alternative to traditional classroom learning. Furthermore, situated training would be a natural opportunity to reflect on safety in connection to new technology, work tasks or procedures. Following the above reasoning, work teams should be involved in the design of such training, something that could provide yet another opportunity to root safety in the sharp end of operations. Making the work floor into a place for organized learning may naturally demand greater resources and support, but it could also serve a multitude of purposes.

**Horizontal communication**

Interviewees on all hierarchical levels testify to an organizational divide between the Oxelösund steel mill and the neighbouring rolling mill. Little contact in safety matters is seen at any level, and the dominating assumption is that this has natural causes. When talking about traditional safety work, i.e. focusing on barriers and safety equipment, this may be true to some extent. When talking about the safety impact of cooperation, communication, involvement and forms of training, however, it is not. Still, several persons from both manager and worker ranks tell of situations where lacking communication has produced severe risks.

The theory of Cognitive Systems Engineering emphasizes the importance of interaction within and outside an organization with regard to its safety performance (Hollnagel & Woods, 2005). Problems in areas like personal safety equipment regularly find their solutions, but reaching beyond enforcement is a wide-spread concern. Presently, management of each facility has to reinvent the wheel in terms of safety. It could be rewarding for managers representing different facilities to make joint efforts in safety work. Safety competence within the organization varies and all parts should be able to benefit from local advances. Given that this situation is not the result of organizational prestige or other structural issues, this could be explored further. At the operator level, some attempts have been made to improve communication, e.g. through so-called handshake meetings. It is not
clear, however, if workers have been properly prepared to engage in these activities, nor what their focus is.

Interviews give no evidence of investigations charting what teams, sections or workplaces interact in a way that could affect safety. At the operator level, there is much uncertainty around common forums and events for safety discussion. One explanation to this could be found in the issue of worker representation, something that has already been discussed. In addition, it is unclear whether safety is a living topic at events where all employees actually do participate, and whether employees are properly equipped to engage in safety related discussions. The need for work manager training in leading discussions has already been mentioned, but the same could very well hold for safety representatives, group representatives and technicians. Continuing, some comments indicate that existing events may be perceived as formalized and impersonal. As an alternative, opportunities for more natural discussions could be found in connection to events of situated training, as described above, where scenario-based exercises are followed by the socially functional “pizza” mentioned by one operator.

One issue closer to the sharp end concerns the activity of hand-overs. Several persons stress the impact these events have on safety, but nevertheless they appear to vary enormously between work sections. What seems to be common, however, is a lack of structure. One section manager retells an episode which occurred at the time of shift change and where consequences could have been catastrophic. There may be much information to pass on at hand-over and because of that, attention is divided. Some comments suggest that the varying forms of hand-overs are caused by the nature of certain work tasks, where operators simply cannot leave their stations at the time for relief. If this is the case, then hand-overs should be studied further in order to find ways of compensating for this. In cases where there is time for proper hand-overs, inspiration could be gathered from industries where the safety impact of information transfer has been thoroughly researched, e.g. aviation, healthcare or energy production.

Another area in need of review and standardization is worker interaction with sub-contractor employees. Operator interviewees report great differences in procedures and tools. Risks do exist in connection to non-SSAB employees, not only for themselves but also for the regular work teams. Research has probed this subject deeply, uncovering common problems in communication, complicated distributions of legal responsibility and safety measures that fail because of unexpected situations (Mayhew, Quinlan & Ferris, 1997). SSAB has focused on fulfilling its legal responsibilities with respect to this issue, e.g. by demanding certain levels of training and requiring sub-contractor personnel to report at the gate. This, however, does little to help sharp-end employees in their interaction with outside consultants. Nor does it tackle other previously mentioned problems, such as locating sub-contractor workers in the case of an emergency. Efforts should be made to find best practices in the handling of this issue and improve communication flow between temporary and permanent workers.

**Reporting and feedback**

One rolling mill section manager states that it is difficult to find your bearings in safety work when few serious accidents actually occur. At SSAB, this fact has caused a great
management interest in incident reporting. For organizations with developed pro-active safety measures and levelling accident statistics, near-miss reporting constitutes one of the most valuable sources of information (van Vuuren, 2000), and provides a golden opportunity to learn about safety (Reason, 1997). Both the steel mill and the rolling mill have been struggling for some time trying to increase the amount of reporting. Not only has this activity been encouraged in communication with the workforce. Currently, a revised, digitalized system for reporting is being implemented. Many interviewees have great hopes for this, stressing its simplicity, transparency and possible speed of processing.

It could be expected that reporting figures would soar given the intense campaign to promote this activity, but instead statistics appear to fluctuate. To some extent, many interviewees believe, this can be explained by the cumbersome, paper-based system that is just about to be phased out. However, this study reveals that other negative factors remain which may continue to inhibit reporting, should they be left unremedied. Firstly, comments suggest that the handling of an adverse event is often carried out in relation to its severity. While it is natural that serious accidents demand immediate action and not all incidents do, this must not become an excuse for slow processing. Many researchers have demonstrated the importance of feedback on all safety related events, for example Hale, Guldenmund and van Loenhout (2010). Feedback generally has a profound impact on the willingness to report and the same applies to a thorough handling of every reported issue. If resources do not allow for quick handling, then that issue must be addressed. Furthermore, feedback often appears to be given individually or posted on a notice board. This means that a valuable opportunity of safety discussion is lost. If, for example, work managers were to engage in more safety related activities with their work teams, then reports could perhaps be brought up in that context, provided that it does not put the reporting individual in a difficult position. On the rolling mill, several more informal ways of communicating issues have been identified. The log book is used for a variety of tasks and operators are expected to bring up safety issues spontaneously. Here it may be important to make sure that MIA is not undermined. MIA reports demand strict handling, and if more and more issues were to be handled informally, then such issues could easily become down-prioritized when workload increases. Furthermore, reporting through MIA means that information about incidents is spread to a wider community, a feature which is lost in informal worker-to-manager communications. Having said this, it is nevertheless important to note that the introduction of log books has likely happened for a reason. Operators have identified a need and engage to form solutions of their own. While this is positive, it may prove more rewarding to map these needs and design communicative innovations which can be used on a larger scale. But another, perhaps more intangible issue in current incident reporting, is the problem of defining the subject itself.

As part of the new, digitalized system for incident reporting, a novel category called “risk observation” has been introduced. It is possible that this innovation has been made to tackle the problem of incident definition and what should be reported. Perhaps the designers of MIA hope to encourage workers to reflect more over the possible causes of incidents. If this is the case, then no interviews suggest that workers have been trained in this kind of reflection. When operators are asked what constitutes an incident, most resort to the rule of thumb commonly referred to as “Oops! and Ouch!”, where “Oops!” denotes an incident where an accident could have happened. The difference between this and events that should
be reported under “risk observation” is unclear and may create some confusion. What is more, one section manager states that issues reported as risk observation will not demand the same thorough chain of processing.

The two facilities exhibit an interesting difference which is related to a problem of definition. Rolling mill operators, in a seemingly unproblematic way, refer to the above mentioned rule of thumb. Steel mill workers, on the other hand, are more hesitant. This could be connected to the problem of accident normalization reported by many interviewees. At the steel mill, smaller burns are in many cases considered part of the job, sometimes even forming part of a person’s professional identity. In the section “worker involvement” it was argued that increased worker participation in safety activities could provide for a sense of safety ownership and job enrichment, i.e. an updated and positive professional identity. It is possible that this sort of openness could also diminish the need to claim macho attitudes. It would likely also open the eyes of operators to new things which can be reported as incidents. Operators feel that it is unrealistic to report many instances of tripping every day, and it is hard to disagree. Working together in safety activities may allow operators to see behind the obvious symptoms of underlying issues and make reporting more diverse.

Equally important is that operators get to see sincere management initiatives to counter these common, even normalized injuries. There is a paradox in the fact that certain types of incidents, e.g. tripping, are often not reported because they are so common. Operators do not feel that reporting every such event is realistic, something that introduces an element of uncertainty to the entire process. Both managers and operators believe that some hazards are simply inherent to the work environment and have few ideas to how they might be remedied. This is problematic, because what is inherent to the environment is a matter of discussion, and such an attitude could easily spread to other categories of incidents. In the end, feeling motivated to report an event presupposes that a remedy can be conceived of, and that in turn feeds into its definition as an incident.

The following section will deal with the focus on behaviours in SSAB safety work. In relation to this, it could also be argued that if a person believes that his or her own behaviour is the major cause of an adverse event, then the envisioned remedy would simply be a change in behaviour. During one interview, a work environment engineer states that persons performing risk analyses have been forbidden to use the phrase “proceed with caution” as a solution to identified safety issues. Paradoxically, this is precisely the envisioned remedy that a behaviour focus in incident reporting would produce. Finally, cognitive systems theory holds that modern industrial systems are tightly coupled and that disturbances may easily propagate throughout. In the present context, this means that the potential hazardous consequences of minor injuries should not be under-estimated. A person suffering a minor injury will be away for a short period, leaving the remaining team little time to adjust. This, by extension, will introduce more severe risks through changed worked patterns, suffering communications and an increased workload.

**Behaviours and attitudes**

In order to visualize the organization’s ambition in safety work, SSAB has produced a graphical representation taking the form of a staircase. Here, the different steps (see Figure 2,
p. 75) correspond to stages on a linear path leading to the organization’s ultimate goal, Zero Tolerance for work related accidents. According to management representatives, measures are in place to cover each of the first five steps, leaving only the last one for processing. No clear definition of the concept “Individual Behaviours and Attitudes” has been given during interviews, but a sufficient amount of indications have been provided to attempt a description. “Attitudes” refers to perceptions around work conduct which are thought to govern behaviour in a negative way. “Behaviours”, as the term is used in practice, is a negative denomination and describes worker actions which in retrospect are used to explain a risk or an accident.

SSAB has come far in its attempts to accomplish a more pro-active type of safety work. Safety measures at many organizational levels have been implemented or revised and safety has been made an explicit priority in all official matters. However, this study has demonstrated that many improvements still remain to be seen in the areas of management presence and communication, management training, worker influence, forms and content of operator training, reporting, feedback and general flow of communication. While management would hold that these steps have been fulfilled, worker comments suggest that they have not. But the problem of addressing “behaviour” as a discrete, operative entity in safety work is not only caused by this imbalance. In the following sections it will be argued that behaviour, rather than a final step, is a product of all these factors and by many other cultural traits. It is not the icing on the safety cake, nor is it the olive in the safety dry martini. Rather, it is a matter of how a person behaves after drinking it.

Interview results reveal an overwhelming dominance of the behaviour construct, particularly in manager explanations of the primary causes of present-day accidents. At the rolling mill, this discourse appears to have spread to all organizational layers, engaging both managers and workers in behaviour-centred interpretations of causality. Interestingly, this is also the only place where local management brings up the question of individual consequences in relation to hazardous situations. There is little doubt that the rolling mill episode retold by a section manager (where an employee was transferred because of misconduct) was a serious one. However, the focus on barriers and by consequence, compliance, appears to be related to the strongly dominating behavioural theme, as well as the call for means to handle those individuals who do not follow the rules. The main line of reasoning would then be that if people would only follow the rules, in a work environment which is perfectly designed, then very few accidents would occur.

Perrow (1984) early noted the increasing complexity of modern industrial systems. According to him, they were becoming so tightly coupled that accidents were almost unavoidable. Modern industrial organizations describe intricate networks of interaction, where actions in different parts of the organizational structure may interact in unexpected ways. This situation introduces an element of unpredictability (Hollnagel & Woods, 2005), and this is also what defines the first problem of behaviour based safety work.

A production chain may seem predictable at first glance, but its different links are interconnected so that actions at one end will have implications for the other. Moreover, the process is also affected by states and events higher up in the organizational hierarchy. Experience from actual work at the SSAB facilities reveals that disturbances do occur, situations where on-the-spot problem solving is called for and where different pressures compete. This is not only true for management and technicians, although it may seem that
way when regarded from above. Operators, too, make numerous decisions during the workday to counter for the same unpredictability. The fact that these actions do not create any problems (but in fact make the process run smoothly) means that they may often pass unnoticed. Instead, people only observe those instances where operators are unable to cope with existing conditions. It is common to blame the individual when trying to understand adverse events (Brown, Willis & Prussia, 2000), maybe testament to some of the many cognitive biases of humans. In fact, this is true for all human endeavours. Engaging in any structured activity, be it football or plate rolling, places high demands on our creativity and ability to make quick decisions with respect to an ever-changing context (Hollnagel, Woods & Leveson, 2006). Many interviewed persons state that workload fluctuates and that trade-off situations between safety and productivity still occur frequently, when different, competing pressures must be balanced quickly. Furthermore, both horizontal and vertical communication is often lacking. These are not optimal circumstances for decision making, which in turn makes talk about optimal behaviour very theoretical. Simply promoting “safety thinking” presupposes an environment that is unchanging and predictable, and that is far from the reality of either Oxelösund facility.

But even if we accept that our working environment may undermine our problem solving abilities, one could still argue for the importance of vigilance at the work floor. The problem is that campaigns trying to create positive behaviours simply by promoting them or arguing for their importance will not make them more likely. Behaviours are produced by the structure of basic cognitive functions, experience, knowledge, trade-offs, social factors and a myriad of other contextual features often unique for every situation (Norman, 1993). They may also be produced by attitudes, but these, in turn, are created from the same stuff as behaviours. Accidents, according to modern risk theory, happen under the influx of combined factors, where some are often removed in both space and time (Hollnagel, Woods & Leveson, 2006). It follows from his line of reasoning that behaviours and attitudes are surface phenomena in the context of work place safety. Pursuing them as a means of improving safety, thus, would be the equivalent of trying to cure a cold by blowing your nose.

It is obvious that actions at the sharp end of operations are connected to the outcome of an adverse situation. The question is whether these actions should be processed directly, or whether one should attempt to create optimal conditions for good decisions. But what would produce good decisions? It follows from research in cognitive science that a person’s thinking is only as powerful as the support it has from the surrounding environment (Norman, 1993). Optimal decision making relies on having the right information, in the right amount, at the right time, the competence to process it, proper contextual support for processing, enough time to do it, and a certainty that no other persons or events will disturb one’s plan of action. These are conditions seldom found in reality, but an organization can make efforts to realize many of them. We cannot simply tell a person to behave safely, because this message will compete will all his other experiences, the organization’s history and all the features of his current context. But we can change the context, and over time provide people with new, positive experiences. This means structuring an organization’s safety management system to satisfy all the safety culture features included in this study. Maintaining some form of “safety thinking” may be difficult over an extended period of time, while organizational changes will provide a continuous reinforcement of positive attitudes. Could this then be a matter of
changing management behaviour? Again, this is only a simplistic truth. Changing manager behaviour, just as changing behaviour at the sharp end, means improving management competence in all safety matters and making sure that nothing competes with their will to realize their safety visions. During interviews, nobody is able to approach a definition of “good behaviour”, vaguely describing it in terms of “being on top of things”, “maintaining control” and “being aware” or “alert”. Perhaps even more striking, nobody knows how to achieve it. This confusion is evident in common explanations of negative behaviours found in the analysis. Either a person has not worked long enough and negative behaviours are therefore explained by lacking experience, or an employee is too experienced and has therefore become “blind” to risks. Furthermore, given that actions at all organizational levels affect safety at the sharp end (Reason, 1990), why are only worker behaviours mentioned in this context? Behaviours and attitudes become wastebasket categories for states or events that the organization is not capable of penetrating. This is particularly evident in the case of the 30 second analysis.

Operators asked about the 30 second analysis typically react with uncertainty and several managers are sceptical to its implementation. Still, the analysis is in theory a structured activity, supported by a tool in the form of a checklist. The problems of using it are manifold. When should it be utilized? How often should it be used? The standard says to carry out a 30 second analysis for uncommon tasks. But what tasks are uncommon? And if these situations are uncommon, how do you know when one of them has arisen? The problems of behaviour-based safety work outlined above apply to all of these questions. Performing the 30 second analysis presupposes that hazardous situations are quickly identifiable. Unfortunately, it lies in the nature of accidents that it is often very difficult to register when their prerequisites are at hand, or even to imagine what the right prerequisites could be. The reasons for this have already been mentioned. All contributing factors may not be visible to the sharp-end operator, but are instead removed both in time and space. The present situation may have developed because of events or states further up in the organizational hierarchy, in distant parts of the complex system, through interaction between several system constituents, or because of events that took place a long time ago (Hollnagel, Woods & Leveson, 2006). This connects to the main theme of behaviours, because both rest on a simplistic model of work. The reasons to why the 30 second analysis is so difficult to implement are the same reasons to why focusing on negative behaviour in safety work is a dead end. If it is so hard to tell when to apply the 30 second analysis, then how will you be able to tell when it is time to choose a good behaviour?

SSAB wants to direct their resources toward preventing negative behaviours. Most of the time, however, things do not go wrong. In fact, it may be rewarding to question whether such negative instances are common enough to make out a dominating team in safety work. A section manager has been cited stating that serious accidents are almost too few to guide safety work, something that could be considered in this context. According to cognitive systems theory, operators in complex systems are constantly managing trade-offs, adapting to changing circumstances. These are actions that often go unnoticed, but paradoxically, they are also what make a process run smoothly. Several operators talk of a lack of positive feedback to safety related actions. Two operators even hold that there should be no need for this type of feedback, because safe conduct ought to be the norm. Lacking feedback on positive safety
events feeds into worker perceptions of manager commitment (Vredenburgh, 2002), but it may also mean that many valuable opportunities for learning are lost. The focus of existing suggestion systems seems to be on the individual genius, presenting some revolutionary, often production-related idea. In an organization where the number of accidents has been greatly decreased, it is very important to take advantage of any opportunities to learn. This, perhaps, could be yet another argument for increasing frequent, collaborative safety training. It is possible that scenario-based activities like these could reveal many positive structures and actions in related to safety. In turn, these discoveries will both benefit safety and create more positive experiences of safety work.

Behaviours and attitudes are problematic concepts, but the above line of reasoning can be used to guide future safety work. A more complex view on human decision making gives that behaviours cannot be directly manipulated in an effective manner. This relates to the forming of safety climate, temporary features in organizational life (Luria & Rafaeli, 2008). Even if behaviours could be affected in the short run, they would later be likely to de-evolve because of lacking contextual support. This is the problem with safety campaigns focusing on propaganda, communicating visions without giving employees the proper tools to reach them. Judging from several interviewee comments, the SSAB campaign for Zero Tolerance is such an example. Given the focus on individual behaviours in safety work, the message behind this campaign could very well be interpreted as a zero tolerance against unwanted behaviours. In the words of Goh, Brown and Spickett (2010), efforts should not be primarily directed at the symptoms of system deficits. Focusing on individual blame may have a very negative impact on worker-manager communication and reporting (Dekker, 2007), and may reinforce worker sub-cultures (Haukelid 2008). The effect may therefore be the opposite of what was intended. Ultimately, such campaigns have been observed to fail (Antonsen, 2009). What is possible, however, is to make sure that all organizational structures are in place to encourage the development of positive behaviours and attitudes. These attitudes may, in the end, influence sharp-end safety in certain situations. It is obviously good if people think about possible risks during the workday, but this is not achieved by telling them to do so. It is achieved by giving them the tools to do it.

**A unified initiative**

At SSAB, many organizational structures (e.g. communication, worker involvement and certain types of training) are not always perceived as given parts of safety work. However, in the same way that safety culture cannot be assessed through individual attitudes alone, nor can safety culture be improved solely through working with attitudes, behaviours or context (Cooper, 2000). Worker behaviours at the studied facilities may be affected by stress, fatigue, monotony, low practical possibility of taking breaks, design flaws in the working environment, implicit production pressure, normalization of risks and injuries, failing routines (e.g. hand-overs), poorly rooted safety measures and lack of realistic training. Other inducers are a general lack of involvement in safety work (e.g. risk analysis, implementation of technology/work tasks/procedures), poor communication, poor guidance (e.g. absent managers), sub-contractor issues and lack of technical competence. Some hints to possible remedies have been given in the preceding sections. Shaping actual solutions will demand
great efforts in the future. A listing is provided in the following chapter which could be used for inspiration.

A more general conclusion can be formulated in relation to the areas of possible improvement. It lies in the nature of some key factors behind safety culture (e.g. drills, training and communication) that success depends on a certain level of uniformity within the organization. In some cases, differing implementations of safety work may be feared to work against each other, diminishing the effects of otherwise well-designed initiatives. This is the reason to why an organization with a positive safety culture is expected to display shared constructs in safety matters (Prussia, Brown & Willis, 2003). It also explains why it may be important to bridge the sharp dividing lines that exist between certain parts of SSAB, and make a unified effort to improve safety culture. If operators and managers collaborate in the construction of a powerful safety management system, then safety will also be a concern shared by everyone. It will become everybody’s business.
Scrutiny of work

Quantitative methods using questionnaires are dominating within the field of safety culture research, but given the existence of sub-cultures, populations are often too small to produce significant results (Guldenmund, 2007). The qualitative methods used in this study have provided a quick immersion into the observed domain and a satisfying depth in data, given the limited possibilities of data collection. As opposed to quantitative means they have provided access to people’s interpretations and conceptions, uncovering effects of interaction and communication. For a person new to the industry, this has provided much needed knowledge of the actual context of work.

This study included 26 employees, obviously a small sub-set of the entire collective of SSAB employees. Consequently, it would likely be criticized in terms of generalizability. But does this concept apply here, the same it would in a quantitative study? Employees are affected by culture, but they also construct it through daily practice. Most of the persons interviewed here are long-term employees and unified perceptions have been found around a number of analytical themes. Whether or not a person’s views are representative of some greater collective, they will still shape work and culture. Trying to compare people’s conceptions and attitudes quantitatively presupposes that their connotations are actually comparable. This problem also applies to qualitative data collection, but interviews at least allow for dialogue, making it more likely that the researcher can work up an understanding of the interpretations made by interviewees. Studies carried out closer to actual operations also reflect a context-sensitive view on safety culture, providing opportunities to penetrate the structure of implemented safety system functions. If anything, it would likely have been rewarding to spend more time at the sharp end of operations, visiting workplaces, meetings and training activities. This could have helped to explain differences between work teams and sections with regard to attitudes and safety-related functions. If one word of warning were to be given to a person undertaking a qualitative safety culture assessment, however, it would be that workload in data processing is very high.

It may be that qualitative assessments are effective in the beginning of an initiative to improve safety culture, providing a rich organizational overview, probing possible issues with existing safety measures. Later, when employees have become accustomed to the terms and concepts of modern safety work, recurring quantitative measures can perhaps provide some sense of state and direction. Such measures, e.g. questionnaires, could then be based on prior qualitative studies.
Conclusions and recommendations

A culture changes slowly, because human interaction needs a certain stability to function smoothly (Haukelid, 2008). It constitutes a form of agreement, albeit constantly evolving, which governs our actions. Safety climate features may be affected in the short run, but lasting changes demand more profound revisions. Campaigns, for example, may temporarily change the way people talk or even behave, but attitudes that do not receive support from the structures of safety management will likely die out. For safety culture to evolve in a positive manner it must be pursued actively, in an organized manner, for a long time (Luria & Rafaeli, 2008). In the words of Cooper (2000), this work must not concentrate solely on behaviours, attitudes or contextual changes. All three factors are mutually reinforcing, although there is good reason to believe that some should be prioritized over others. Using qualitative methods, a rich description of current SSAB safety work has been provided that overcomes the limitations of more common safety culture assessments questionnaires. This, in turn, answers research question 4. A systems view on safety has brought focus to issues in communication and other types of interaction between system functions and organizational layers, something that has been argued to answer research question 2.

For a long time, interviews have revealed, SSAB has concentrated on trying to improve safety related behaviour through verbal encouragement. The organization’s staircase model is meant to suggest that all steps except work on attitudes and behaviours have been climbed, but the preceding discussion argues that the situation is rather the opposite. Measures aimed directly at winning the hearts and minds of employees are in abundance. This is evident in ever-present safety-promoting posters and in the fact that managers are perceived mainly to “remind about the importance of safety”. Cooper (1998) describes attitude-improving campaigns as a common fallacy in safety work. These activities often fail because of lacking upper management presence, lacking support for work floor managers, and because of the fact that campaigns are carried out without supplying the proper tools to make visions into reality. What is needed is the organizational support for positive attitudes, and that kind of support is created through developing concrete safety related activities and tools. While the safety work of SSAB has taken a positive turn during the last couple of years, some issues do remain. This organization appears to have reached a plateau in accident statistics, making it an ideal candidate for safety culture work (Reason, 2000). The discussion chapter brought up a number of weaknesses in present attempts to change behaviour in a direct manner. This has answered research question 1 in terms of management presence and communication, management training, worker influence, forms and content of operator training, reporting, feedback and general flow of communication. For example, making procedures into collaborative projects has been argued to bridge the gap between operator requisite variety and process stability, answering research question 3. In this chapter, further suggestions will be listed that could be used as a base for exploring new possibilities in pro-active, collaborative safety work.
Harmonized communications

Many SSAB managers find it hard to maintain a steady presence at the work floor. This study has demonstrated that such a presence has a deep impact on workforce perceptions of manager commitment, and ultimately, workforce commitment to broad safety initiatives. Poorly rooted initiatives combined with lacking management presence leads to distrust and weak commitment. Lacking presence has also caused some initiatives to lose their momentum. This might have been avoided through more effective communications between the organization’s hierarchical layers. It is easier to destroy than to create, meaning that only a few negative experiences may have a deep negative impact on safety culture. Interviews suggest that the verbal safety commitment of management is clear, but that conflicting situations sometimes arise. The steel mill inventory initiative is an exemplary attempt to tackle this issue head-on, but more work still remains. In the discussion it was also mentioned that most of the time, things go right. In relation to this, efforts should be made to find ways of creating and emphasizing positive experiences of safety work.

Identify conflicting messages

- Explore the relation between productivity and safety. Demonstrate clearly how each conflict is mediated
- Investigate the suspicion that productivity may be implicitly prioritized because of biased communications – how may a manager’s actions be interpreted at the work floor?
- Investigate what actors engage in trade-off decisions when managers are unavailable, e.g. during nights or weekends
- How has the organisation behaved historically, in periods of economic difficulties?

Evaluate vertical communication

- How does management communicate?
- How are its messages received?
- Evaluate Steelnet with regard to layout, information width/depth, accessibility and local deviations
- Are there alternatives to one-way Steelnet communications?

Anchor central initiatives within the workforce

- The campaigns for eye protection enforcement, “safety first”, the Zero Tolerance vision and the 30 second analysis should be evaluated
- Design central initiatives with input from local workshops
- Give the workforce proper tools to satisfy management’s visions – winning the hearts and minds of employees should be the last step of implementation, not the first
- Make sure that central initiatives are followed-up locally, with broad involvement from work floor employees
Find ways of emphasizing positive actions and events

- A person’s experiences affect his attitudes. Management must find ways of creating and emphasizing positive experiences around safety work
- Share experiences between currently isolated organizational branches

Feedback

- Make sure that feedback in safety related matters is consistent, frequent and widespread
- Operators believe that safety is allowed to cost money, but have little knowledge about all the on-going work - make sure that the prioritization of safety is visible to the workforce

Design of management

Management presence is partly obstructed by heavy workloads and insufficient tools for safety management. This situation has been improved at the steel mill through the appointment of work managers, but other workplaces do not share this organizational structure. Ways must be found of compensating for this, because there is strong research evidence for the importance of work floor management (Flin, Mearns, O’Connor & Bryden 2000, Gadd & Collins, 2002; Zohar & Luria, 2005; Guldenmund 2007). Furthermore, interviews suggest that management often has a juridical or technical focus in safety work. Management training could also be designed to increase competence about cognitive and systems factors affecting safety.

Increase delegation

- Explore the possibilities of delegating more safety related tasks to the work teams - This could free up resources for management and at the same time increase worker involvement in safety work
- Search for ways of supporting managers in order to increase their work floor presence

Analyse the safety management function of every manager role

- Make sure that the training for every management position reflects the specific needs to fulfil that role – this should be a process of participatory design
  - What tools are there for safety management? How are they used? How are key safety activities managed? How are discussions around safety led? How can safety work be evaluated? How can feedback be given?
- Reinforce training with modern research on cognition, complex systems and safety
- Continue to focus on the development of work manager competence, and make sure that they have the requisite organizational backup for managing safety
- Where work managers do not exist, explore the possibility of empowering safety representatives through support, responsibility and competence
- Look for ways of supporting corporate upper management in their safety related work tasks
Safety ownership

Safety culture research has demonstrated that worker involvement in the design of regulations, routines, equipment and machinery creates positive attitudes in regard to related innovations. It also makes it more probable that implementations are properly adapted to work floor demands. Finally, involvement produces commitment, which is invaluable in maintaining a safety focus when managers are unavailable, e.g. during nights or weekends. Operator interviews suggest that some safety equipment may be problematic to use, but that discussions have been unproductive.

At these facilities, trade-offs between efficiency and thoroughness, safety and productivity, are ever-present. Not many negative experiences are needed to undermine worker attitudes, and given that workers do not always discern between authorities, production pressures manifested at night or during weekends could still be taken to emanate from management. Highlighting and processing such trade-offs must be a collaborative effort. Good opportunities for discussions could arise if training was carried out in more direct connection to the sharp end of operations. Operators as well as managers perceive current training initiatives as too removed from the realities of day-to-day work. Joint, situated training efforts could create more natural opportunities for reflection and discussion over safety matters. Activities like these could also reinforce more infrequent courses. While the 30 second analysis is difficult to implement in a meaningful way, operators working together around scenarios at the workplace could make risks easier to identify. After all, thinking, as defined by cognitive science, is a collaborative and distributed activity.

Involvement

- Look for ways of increasing worker participation in concrete, safety related tasks
  - Risk analysis, checks, procurement of safety equipment, conflict inventories (safety-productivity trade-offs), work planning, manning, timetabling

Revisions

- When it is time for revisions, commit more thoroughly to operator participation. This can be done in the design of
  - Training initiatives, safety equipment, barriers, work tasks and procedures, communication, safety & productivity goal setting

Training

- Explore new forms of situated, realistic training, close to the real work context
- Strive to make training into joint activities – requires multi-axis interaction analysis
- Group problem solving can be trained around other themes than emergency evacuation
- Make sure that structures at the work place mirror and reinforce what has been learnt during training – how can theoretical knowledge be cemented through practice?
- There is mention of attempts to involve experienced operators in the training of new employees – But is this work structured?
Professionalism and commitment

According to safety culture research, there are certain features of a work role which can be expected to have positive effects on safety outcomes. If a job is perceived as valuable, challenging, stimulating and varying, then commitment to both safety and work in general will likely increase (Cooper, 1998). An employee who is part of setting goals in production and safety who participates in different activities of design or planning will find it easier to relate to procedures, tools and work tasks (Antonsen, 2009). Interviewees report that sub-cultures within the SSAB Oxelösund compound become increasingly negative and macho-oriented the more physically demanding and dirty a workplace is. A reported extreme is the handling of coke, but this could apply for many tasks in the production chain. It could be speculated that when a person’s work conditions are severe, macho attitudes are used to restore a sense of pride in his work role. Furthermore, if certain hazards are perceived as unavoidable, macho attitudes could be adapted to compensate for a sense of powerlessness. Attitudes will affect the way safety initiatives are received (Haukelid, 2008), and because of that, job enrichment (Hackman & Oldham, 1976) could be a way of improving commitment to safety work. There may be many ways of constructing a strong, positive work identity. Below are a few topics that could be explored, some which overlap the above section on involvement.

- Competence development, e.g. work rotation
- Increased responsibility, e.g. worker participation in planning and goal setting
- Operator responsibility for training and evaluation
- Constant development of procedures – manifests worker competence
- Risk of skill loss through automation
- Feedback on the results of work

Sharing experiences

In a complex system, disturbances may propagate in unexpected ways, and there is always a certain element of unpredictability (Hollnagel & Woods, 2005). This is one of the reasons to why both horizontal and vertical communication are key to process control, but safety culture research has also demonstrated many other positive effects of improving cross-scale interaction (Prussia, Brown & Willis, 2003). Another important tool of communication is the reporting system. A new version of this system has recently been implemented, but several more fundamental issues seem to persist. Below are a number of themes which could be explored in this context.

General communication

- What opportunities are there for safety discussions between regular operators? Participative forms of training and work place development could provide this
- Is there communication between work teams, sections or work places that may affect safety?
- Is proper feedback in all safety related manners given to operators both consistently, frequently and in a wide-spread manner? Is inclusion maximized? Are there enough resources for this?
- May democracy through representation impair communication?
- How is the spreading of information affected by private/shared e-mail addresses?

Reporting

- Could operators be helped to see beyond the direct causes of common incidents such as tripping?
- The problem of normalization ultimately lies in the perception of inherent, unavoidable risks - this must be addressed
- A productive discussion at the work floor should exist around near-misses
- Could other activities compensate for the monotony of reporting frequent incidents?
- The new MIA opens for speedier processing, but in the end, managers are responsible for giving feedback in a productive manner
- Has the new concept of “Risk Observation” been matched with proper operator training and handling procedures?
- Could MIA be undermined by informal/alternative types of rolling mill communication?

Sub-contractors

- Could standardized means of sub-contractor registration at the workplace help in the interaction between temporary and permanent employees?

Hand-overs

- Explore the possibilities of implementing structured handovers
- Gather inspiration from high-risk industries
- Could handovers be extended to all workplaces, or does work at some stations make this impossible? In that case, could this be compensated?

The core of pro-active safety

Comments during interviews suggest that SSAB has taken many steps toward a more pro-active form of safety management, but in some cases it may be suspected that measures do not reach their full effect. The preceding discussion gives that most structures are in place, but that implementation is not always optimal. Because of this, it is not certain that more resources are needed throughout, rather that resources should perhaps be reallocated.

Challenge core assumptions

- A number of issues have been raised in this study concerning the use of behaviours and attitudes as functional terms in safety work. Even if some use could be found for these concepts, it may at least be rewarding to challenge such common explanations of risks and accidents
Many forms of safety work are generalizable – different units could collaborate more in developing new types of pro-active safety measures, training, drills, development work and communication structures

**Review the 30 second analysis and “safety thinking” initiatives**

- The 30 second analysis is the hallmark of the organization’s current focus on behaviours in relation to safety, but interviews suggest that it has failed
- Risk analysis
- Grant uniform risk analyses when new technology, equipment, procedures, work tasks and work patterns are implemented, and that all projects implement safety and participation, both in theory and in practice

**Developing an action plan**

It is often harder to see immediate effects of organizational, non-technical safety initiatives (Goh, Brown & Spickett, 2010). A culture changes slowly and many, diverse factors affect its development. This is why an initiative to improve safety culture must be a broad, unified and persistent project (Cooper, 1998). It follows that this project should be guided by a detailed action plan incorporating all the facets of safety work identified and analysed in this study. Here, every safety culture factor should be matched by concrete measures. Such a plan would have to be firmly rooted in the organizational instances expected to implement its different methods and goals. Avoiding past mistakes, well-defined means of safety work should be provided before visions and goals are presented, ploughing before sowing. To maintain the integrity of this project would demand constant organizational self-analysis, in order to make sure that every function reaches its full effect and is not negated by competing pressures or activities. Developing such an action plan is in itself a major task. The result, however, could be an entirely new stage in the evolution of SSAB safety work.
References

Articles


Books


Appendix 1

Intervjumall - Arbetare

- Vad har du för bakgrund?
- Var arbetssäkerhet en del av din utbildning?
- Har du fått utbildning i säkerhet här?
- Vilken? Hur ser den ut?
- Vilka deltar på samma utbildningar?
- Finns det återkommande träning/utbildning?
- Är den tillräcklig/bra?
- Anordnar man övningar/träning med säkerhetsfokus? Värdering?
- Hålls det andra aktiviteter som handlar om säkerhet? (Utbildning i samband med nya säkerhetsåtgärder? Lärdomar/diskussion efter incidenter?)

- Vem är främst ansvarig för säkerheten på arbetsplatsen?
- Tycker du att dina närmaste chefer är engagerade i säkerhetsarbket?
  - Hur? (ex. Reaktionssnabbhet, delaktighet/närvaro, säkerhetsinsatser, kontroller, utrustning, pratar ofta om säkerhet)
- Tycker du att ledningen är engagerad i säkerhetsarbket?
  - Hur? (ex. Investera i säkerhet, Reaktionssnabbhet, delaktighet/närvaro, säkerhetsinsatser, pratar ofta om säkerhet)
  - Satsar man på säkerhet?
- Hur snabbt åtgärdar man problem som har upptäckts?
- Förstår ledning/chefer hur arbetet på golvet går till?
- Prioriteras säkerhet framför produktionen?
  - Exempel på sådana situationer?
- Har säkerhetsarbket förändrats under din tid här?

- När kan arbetare diskutera säkerhetsfrågor? (ex. Möten, skyddsronder, workshops)
- Är arbetare representerade i säkerhetsarbete högre upp?
- Finns det skyddsombud? Vad är deras roll?
- Vem har inflytande över arbetsplanering / säkerhetsarbete / design / inköp?

- Kommunicera arbetare med ledning/chefer? Vilka?
  - Hur gör en arbetare för att kommunicera med högre ledning?
- Vilken kommunikation sker från ledning till arbetare, både säkerhetsrelaterat och annat?
  - I vilka former? (Möten, anslagstavlor, webben etc)
  - Hur ofta?
  - Är kommunikationen dubbelriktad?
- Sker någon kommunikation mellan arbetslag / arbetsplatser / anläggningar i t.ex. säkerhetsfrågor?
- Har man möten för att koordinera arbetet i ett arbetslag?
  - Vilka deltar?
  - Hur ofta?
- Vilka rapporteringsverktyg finns?
  - Vad kan rapporteras? (Risk, incident, förslag, positiva utfall/erfarenheter)
Vad sker med en rapport?
Får man feedback?

Är det vanligt med underentreprenörer på arbetsplatsen?
- Hur funkar samarbetet med dem?
- Är de delaktiga i säkerhetsaktiviteter?
- Medför underentreprenörer några speciella säkerhetsproblem?

Vilka är de vanligaste olyckorna?
- Varför inträffar de tror du?
- Vilka är de största riskerna på din arbetsplats?

Vilka säkerhetsåtgärder finns ute på arbetsplatsen? (ex. Barriärer - fysiska, procedurer, regler, AM-planer, arbetsberedning osv)

Vilka är de viktigaste säkerhetsåtgärderna tycker du?
- Hur ser du på procedurer? (ex. Syfte, betydelse, vikt)

Varierar arbetet/arbetsbördan mycket?

Hur bemöter man incidenter på arbetsplatsen?
- Vad är typiska åtgärder?
- Vad sker vid tillfället?
- Vad sker efteråt?
- Får ni någon återkoppling?

Finns det några förebyggande åtgärder?
- (ex. Riskbedömning, arbetsberedning, kontroller, near-misses, säkerhetsronder, risk i arbetsplanering, träning, diskussion av positiva erfarenheter, Belöning av positiva resultat/beteende, design för säkerhet)
- Hur fungerar de?

Gör man undersökningar/återkopplingar om säkerhet...
- När ny teknik införs?
- När utredningar har gjorts?
- När saker rapporteras eller föreslås?

Vilken del av säkerhetsarbetet tycker du är viktigast?
Appendix 2

Intervjunall - Ledning

- Vad har du för bakgrund?
  - Var arbetssäkerhet en del av din utbildung?
- Har du fått utbildning i säkerhet här?
  - Vilken? Hur ser den ut?
  - Vilka deltar på samma utbildningar?
  - Finns det återkommande träning/utbildning?
  - År det tillräckligt?
- Anordnar man övningar/träning med säkerhetsfokus för ledning/på anläggningen?
- Hålls det andra aktiviteter som handlar om säkerhet?
  - Utbildning i samband med nya säkerhetsåtgärder?
  - Lärdomar/diskussion efter incidenter?

- Vem är främst ansvarig för säkerheten på arbetsplatsen?
- Tycker du att du/dina närmaste chefer är engagerade i säkerhetsarbetet?
  - Hur visas? (ex. Reaktionssnabbhet, delaktighet/närvaro, säkerhetsinsatser, kontroller, utrustning, pratar ofta om säkerhet)
- Tycker du att personerna på arbetsplatsen är engagerade i säkerhetsarbetet?
- Hur snabbt åtgärdar man problem som har upptäckts?
- Prioriteras säkerhet framför produktionen?
  - Exempel på sådana situationer?
  - Satsar man på säkerhet? Hur? (Träning/utbildning, skyddsutr., annat?)
- Har säkerhetsarbetet förändrats under din tid här?

- Diskuterar du säkerhet med personal på arbetsplatsen? (ex. Möten, skyddsronder, workshops)
  - Vilken makt har de olika funktionerna?
- Vilken typ av säkerhetsarbete är du själv delaktig i?
- Vilka har inflytande över arbetsplanering / säkerhetsarbete / design / inköp?

- Hur kommunicerar ledningen med arbetare, både i säkerhetsfrågor och annat?
  - I vilka former? (Möten, anslagstavlor, webben etc)
  - Hur ofta?
- Sker någon kommunikation mellan arbetsplatser / anläggningar i t.ex. säkerhetsfrågor?
- Vilka rapporteringsverktyg finns?
  - Vad kan rapporteras? (Risk, incident, förslag, positiva utfall/erfarenheter)
  - Vad sker med en rapport?
  - Vad används informationen till? (i säkerhetsplanering t.ex.?)
  - Ger man feedback? Varifrån?
- Är det vanligt med underentreprenörer på arbetsplatsen?
  - Hur funkar samarbetet med dem?
  - Är de delaktiga i säkerhetsaktiviteter?
  - Medför underentreprenörer några speciella säkerhetsproblem?
• Vilka är de vanligaste olyckorna?
  o Varför inträffar de tror du?
• Vilka är de viktigaste säkerhetsåtgärderna tycker du?
  o Hur ser du på procedurer? (ex. Syfte, betydelse, vikt)
• Varierar arbetsbördan mycket i anläggningen?
• Hur bemöter man incidenter på arbetsplatsen?
  o Vad är typiska åtgärder?
  o Vad sker vid tillfälle?
  o Vad sker efteråt?
  o Ger man någon återkoppling?
• Finns det några förebyggande åtgärder?
  o (ex. Riskbedömning, arbetsberedning, kontroller, near-misses, säkerhetsronder, risk i arbetsplanering, träning, diskussion av positiva erfarenheter, Belöning av positiva resultat/beteende, design för säkerhet)
  o Hur fungerar de?
• Gör man undersökningar/återkopplingar om säkerhet...
  o När ny teknik införs?
  o När utredningar har gjorts?
  o När saker rapporteras eller föreslås?
• Vilken del av säkerhetsarbetet tycker du är viktigast?