Manufacturing Cooperation:
An Ethnography of Norwegian Factory Regimes

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Preface

I grew up in an industrial town where the factory was always visible on the horizon. Smoke emerged from chimneys 24 hours day, every day of the year. I started upper secondary school, did my military service, and went to university. Every time I came back to visit my hometown, the factory was there, as predictable as the river running next to it, year after year.

I never did pay much attention to it. Not when I studied economic history in the mid-2000s, nor when I became critical of corporate globalization after reading authors such as Naomi Klein (1999) or Erik Reinert (2004). I started to see the macro trends of capital mobility and liberalization as problematic, yet I never really saw them as having anything to do with my hometown, its factory, or other industrial towns in Norway. Globalization was happening somewhere else, on a global level, not in my backwater hometown. A town I and my friends left for university studies in bigger cities as soon as we were old enough – cities closer to the important processes shaping the world, we thought.

In our critical discussions of trade liberalization, it was assumed that with the removal of tariff barriers, capital would move production to wherever wages and environmental regulations were lowest, creating conditions for a race between countries to remove such regulations. Nevertheless, while this idea has stood the test of time quite well, not all industry moved to the global south or elsewhere in a hunt for cheaper labor. Some firms remained in high-cost countries like Norway. Among these was the factory in my hometown. While I had been busy growing up, travelling the world and forming a critical view on globalization processes, the factory had stayed put. This sparked my curiosity; how could this be? Why wasn't production moved to some country where input factors like electricity and labor were cheaper? The small-town inertia we had sought to escape from, could it be so strong that it even counteracted the tendencies of capital mobility and globalization?

Acknowledgements

Abstract

The research objective of this dissertation is to understand why factory regimes differ between Norwegian manufacturing firms involved in global competition. Literature on the Norwegian cooperative model (NCM) maintains that there are particular advantages conferred on firms by the Norwegian institutional context. Central among these are: knowledge mobilization from delegation of responsibility to workers and cooperation between firm and trade union for firm development. The empirical puzzle explored by this dissertation is thus: Why do not all firms adhere to the prescriptions of the NCM literature?

I answer this question by comparing two manufacturing firms with different factory regimes, known here as Safe Manufacturing and Metal Industries. Informed by data from fieldwork, I show how one firm adheres to the prescriptions of the NCM while the other does not. A contribution of this dissertation comes from locating the NCM in everyday practices and beliefs on the shop floor, showing how the organization of work and its reproduction is embedded in local *webs of significance*. Hence, the question of how work is organized should not be reduced to the influence of markets or institutions, but can be fruitfully answered by accounting for how local actors understand such external contexts.

My analysis draws on theoretical concepts from several traditions, under the slogan of *coherence in meaning, plurality in theory* (Reed 2011). Regime, reproduction, ideology and class compromise are central in showing how Safe Manufacturing and Metal Industries differ. They differ because the *challenges of production* are understood to be different by local actors. The way these challenges are understood, have consequences for how work is organized, and in turn, for the relevance of the advantages prescribed by the NCM.

I contribute to the literature on the NCM by arguing that the model should not be understood as a "best practice" immediately relevant for all manufacturing firms.

Instead I propose two concepts to differentiate the advantages conferred on firms from the Norwegian institutional context: passive and active advantages. The former designates advantages conferred on firms such as the formal regulation of conflicts and collective bargaining. The active advantages on the other hand, need to be created locally and do not "trickle down" from the institutional framework, and involve the mobilization of worker knowledge and cooperation for firm development.

Contents

Chapter 1: Framing the Research Question

The research question structuring this ethnography has been scrapped and reformulated several times. It started out from a an interest in manufacturing firms and the possible competitive advantage bestowed on them by their location in Norway. The concept of *employee-driven innovation* (Sørensen et al. 2014) seemed a good starting point to understand how workers contributed to the success of Norwegian manufacturing firms in global competition. The goal became to learn more about the nature of employee-driven innovation (EDI) on the shop floor; how was worker knowledge mobilized for innovation? I had a notion that there must be some commonalities between firms, some lowest common denominator in how knowledge was mobilized for competitive advantage. With this pre-understanding, I found some promising looking cases and set out to explore what EDI looked like at the micro level of social relations.

Towards a Research Question

After fieldwork in the first firm was completed, my research question started to look like a "thin" question posed to "thick" data (on thick description, see Geertz 1973). Workers' motivation for participating in EDI was just a small part of what was going on on the shop floor, and was embedded in beliefs, relations and practices. Trying to isolate the motivation for EDI risked obscuring more than explaining why my informants acted as they did. My goal changed towards making a holistic description of firm culture, to better understand what was going on. This sparked an orientation towards industrial sociology and the so-called Norwegian model – used to designate the institutions regulating Norwegian working life. I started to see my data through the lens of Michael Burawoy's work on regimes of production (1979, 1985). Burawoy developed a theoretical account of production regimes from fieldwork in the United States, post-colonial Zambia and Communist Hungary. Surely, this conceptualization could be used to forge a narrative of a social-democratic production regime? My ambition changed from finding common ways of doing EDI between the two firms, to

elucidating a Norwegian or social-democratic production regime from my two cases. By comparing the different firms, I would find the commonalities between them, and go on to craft a narrative of a social-democratic production regime. For surely, firms successful in global competition located in high-cost Norway would have to utilize the advantages offered by the Norwegian institutional framework?

My first fieldwork was conducted at an aluminum smelter referred to here as Metal Industries. There I encountered much of what I had learned to expect from reading literature on the Norwegian model. My second fieldwork took place in a firm producing equipment for the offshore industry, referred to here as Safe Manufacturing. Here I encountered a reality that differed markedly from the prescriptions of the Norwegian model. At Metal Industries, autonomous teams of operators coordinated production without a foreman telling them what to do. At Safe Manufacturing, leading workers and foremen continuously instructed workers in what to do next. Operators at Metal eagerly contributed their knowledge to EDI and participated in time studies, while the CEO talked about the people on the shop floor as the most important asset. At Safe, the knowledge of workers was not utilized in the same way, and discontent on the shop floor was seen as a result of workers not being knowledgeable enough of the ambitious strategy of management.

Cooperation in the field of industrial relations is a cornerstone of the notion of a Norwegian model. At Metal, such cooperation was well established and regarded as important by both trade union and management. At Safe, the relation between executives and the trade union was characterized by disagreements, and there was little talk of cooperation for the development of the firm. Still, both Metal and Safe seemed to do well on the global markets they were competing in. The differences between the firms stood in sharp contrast to my expectations, which were informed by literature on the benefits of the Norwegian cooperative model (NCM). The more concepts I enlisted in my analysis, the more different the firms appeared.

Initially, my inability to explain these differences created doubts on behalf of my project. If there was a best way to organize industrial production within the institutional context of Norwegian working life, why weren't the firms more alike? During analysis, however, I came to see this mystery as a boon rather than a problem.

The differences between the firms meant that contrasting observations from the two sites made it possible to see things in the data I would not have seen as clearly had the firms been similar. My research focus became to understand the local contexts of meaning that produced these differences, in order to explain why it made sense for Metal to adhere to the prescriptions of the NCM, while it did not make sense for Safe. This focus enabled me to explore the conditions for the NCM at the level of the firm. The task of thick description went from elucidating the commonalities of Norwegian production regimes, to understanding the meaningful contexts producing different regimes.

The Norwegian sociologist Gudmund Hernes (2006) argues that the Norwegian model and its counterpart on the level of the firm, the Norwegian micro model,[1] should not be reduced to a question of institutions. It can also be understood as a political culture informing the values of a broader culture of collective action, and Hernes offers a definition of culture as "a script for a way of life (Ibid. 18)." Hernes' notion of culture as a script is useful for describing how I see the NCM, as a script for how Norwegian manufacturing firms can succeed in global competition. In this light, this dissertation becomes an exploration into why some firms adhere to this script, while others do not. To fully answer the why of this question, it is necessary to focus the investigation on the local landscapes of meaning in the firms, locating the answer in the webs of significance to which actors' motivations pertain.

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[1] Hernes uses the micro model to describe the level of the firm. This dissertation will stick to the concept of the Norwegian cooperative model to designate what goes on in firms, as this was more common in the literature I have drawn on.

Employing Burawoy's notion of regime aims at holistic understanding of local meaning – asking what people do and why they do it. Not in the sense that the goal is to understand everything, but rather holistic in the sense of understanding how different practices and beliefs are intertwined. The focus on working life entails venturing into the theoretical terrain of industrial sociology and organization theory. In this landscape, questions regarding the organization of work after Fordism have engendered large debates, along with related questions such as autonomy in work, increased flexibility, and financialization. While the narratives from Safe and Metal contain examples relevant to such debates, the main goal of this dissertation is to understand the local webs of meaning in which the practices under scrutiny are intertwined.

In doing this, I will heed the advice of Stephen Barley and Gideon Kunda and *Bring work back in* (2001). In their article, Barley and Kunda argue that organization studies suffer from a lack of attention to work. As work and organizations are bound in a "dynamic tension" (Ibid.: 1), failure to grasp the everyday reality of work leads to unsatisfactory understandings of organizations and organizational changes. The authors identify "environmentalism" as one unfortunate consequence of the lack of attention to work, using it to designate studies which overemphasize the environment of organizations. My naïve belief that manufacturing firms would unanimously adhere to the script of the NCM might serve as an example of such environmentalism; supposing that a best practice in the organization of industrial production can be deduced from the institutions regulating working life. Both markets and institutional contexts matter for how Metal and Safe are organized, but to understand *how* they matter, thick description of local meaning is necessary. Richard Swedberg argues in a similar vein when stating that: "Much more attention should also be paid to the role of work on an everyday basis inside the firms; and on this point the industrial sociology of the 1950s could be a model to emulate (2003: 103)."

Understanding the NCM as an example of a factory regime allows for understanding how characteristics such as an autonomous labor process and cooperation for firm

development are not merely isolated characteristics, but are interconnected. Both coordination of the labor process and cooperation in industrial relations are questions about what people do and why they do it. These practices are embedded in actors' interpretations, and to explain them it is necessary to understand the webs of significance to which these practices pertain. The fundamental task of solving the empirical puzzle of the different firms thus becomes a question of "exploring the ways in which social practices are sustained and transformed through the interplay and contest of the beliefs embedded in human activity"[2] (Bevir and Rhodes 2005, 5). Interpreting local webs of meaning makes it possible to go beyond descriptions of practices and say something about why these practices and meanings are sustained over time; how they are reproduced. Thick description combined with a dialogue with pre-existing theory enables the researcher to "connect the present to the past in anticipation of the future" (Burawoy 1998, 5). It allows for theorization of not only the current state of affairs of the NCM in the firms, but to understand how it is related to past actions, and why it is that some practices are sustained over time; why they are reproduced by actors.

Being present at the site of ongoing practices allows for the observation of meaning in action (Bevir and Rhodes 2005). Locating the scientific object of regime in webs of significance on the shop floor makes it possible to understand the NCM in action. Exploring the NCM as a regime, as interconnected beliefs and practices on the micro level, makes it possible to answer the question of why the NCM is relevant for some firms and not others – a question that bears significance not only for Safe and Metal, but for everyone concerned with the Norwegian model and the organization of work.

Research Questions

As have been made clear in the preceding section, the research question has been reformulated several times, based on a continuous negotiation between theory and data. The overall research objective structuring this dissertation is to understand *why*

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[2] Minor paraphrasing of original quote.

factory regimes differ between Norwegian manufacturing firms involved in global competition. The contribution of ethnography is to situate the Norwegian cooperative model in the practices of everyday work, and thus explore the conditions for reproduction of the NCM at the firm level. In order to understand why factory regimes differ, I pose four research questions to my data from Safe Manufacturing and Metal Industries. These deal with different aspects of the factory regimes, and corresponds to chapters four to seven, before I address the reproduction of regimes in chapter eight.

1. Why do the firms employ different strategies to accumulate capital?

2. How is the labor process controlled and coordinated, and what ensures the reproduction of authority?

3. Why do the firms employ different means to reduce labor expenditure and raise labor value?

4. Why do industrial relations differ between the two firms?

The concepts of *regime* and *reproduction* are central in the questions, and are inspired by Michael Burawoy's ethnographic studies, which emphasize the *subjective* side of work: "as men and women transform raw materials into useful things, they also reproduce particular social relations as well as an experience of those relations (1985: 7-8)." While Burawoy was interested in how the experience of production shaped the broader class struggle, this dissertation will examine how the experiences from production might influence industrial relations in the firms. According to literature on the NCM, *cooperation for development of the firm* (between trade union and firm) is central in Norwegian firms. The main research question is thus concerned with why this cooperation continues to take place (or not); how is it reproduced?

Burawoy's use of *regime* encompasses both the effects of the labor process mentioned above (reproduction of social relations and an experience of those relations), as well as what he called the *political apparatuses* of production: collective bargaining, a grievance machinery, and an internal labor market. These apparatuses combine to turn workers into industrial citizens with rights and obligations. This dissertation uses

regime in a slightly different way than Burawoy, understanding strategy, the organization of the labor process, the way labor cost is reduced, and industrial relations, as different aspects of the factory regime. Over the course of the analysis however, it will become clear that these are neither isolated nor coincidental characteristics, but rather are conceptualized in this way because they have effects on each other. Studying these characteristics therefore provides a way of understanding the reproduction of cooperation in the two firms. Hence, while Burawoy's notion of regime has directed the analytical gaze of this dissertation, it will be adjusted in accordance with the needs of my data and calibrated with the other theoretical concept informing my investigation, namely the *Norwegian cooperative model*.

The Norwegian model and related concepts are used in a multitude of ways. Some refer to institutions regulating working life, while others refer to the welfare state, or even macroeconomic policy[3]. The topic of this dissertation is what goes on at the level of the firm. In addition to the Norwegian cooperative model, the *Norwegian micro model,* first introduced by Hernes (2006), has also been used to describe the firm level. When I use the Norwegian cooperative model rather than the micro model, it is because the former is more common in the literature I have accessed. It is both a topic of research, as well as a normative concept used in debates between labor market parties or politicians. Hence, its meaning is not always agreed upon. In this dissertation, I will understand the NCM to prescribe a certain type of regime in firms, involving an organization of the labor process where responsibility is delegated to workers, and where industrial relations are characterized by cooperation for firm development. This will be developed further in the next chapter. I will add here, however, that this dissertation makes no attempt to "summarize" the literature on the NCM, nor provides any condensed "essence". Instead, I draw on literature on the NCM in order to construct a heuristic device, an analytical construct, to help me make sense of my data and put them in a dialogue with research on Norwegian working life.

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[3] See Cappelen and Fagerberg (1992)

A final point regarding the concept of reproduction in this dissertation, is that reproduction necessarily is a question of both internal and external relations. The reproduction of a production regime is a question of what happens in the firm, but also of what happens outside the firm. This study, however, will focus on the former, being content with grasping the internal dynamics of the firms. External forces will be part of the investigation only when they can be unpacked as beliefs held by actors in the firm.

Research Strategy

Michael Burawoy's notion of production having a political and an ideological moment points the focus towards the micro level of relations and people's experience of production (1985). To learn about relations between people in production, it is necessary to observe production, as well as talk with people engaged in production. I am not primarily interested in the formal side of production, such as organizational charts or whether the firm lives up to national standards of cooperation in industrial relations. Rather, my primary interest lies with the meaningful context of interaction on the shop floor. And it is here, within *the webs of significance* enveloping everyday work (Geertz 1973), that I will seek the answers to the research questions. This will be done by drawing on fieldwork and interviews in order to produce an ethnography of Norwegian working life.

Swedberg (2003) has argued that the main concern of economic sociology is the impact of social relations on economic actions. This investigation sets out from a different point of view, namely the premise that the economy itself is a social process, and therefore can be fruitfully interrogated by a conceptual apparatus rooted in sociology. The economic activity of industrial production is not primarily 'economic' or 'technological'. It is about people, their beliefs, motivations and actions. In line with this, the NCM is understood to refer to something people do in the practice of everyday work. Or rather, a bundle of practices, as designated by the characteristics of the ideal type of a cooperative regime. Thus, the regime points to something people do in their everyday work. Control and coordination of the labor process must necessarily involve

worker-worker or worker-manager interaction. Robotization, if it is to reduce labor cost, must necessarily have some impact on the labor process, through robots taking over tasks from people. When it comes to industrial relations, one might argue that interaction between firm and trade union might not be part of everyday work. Still, interaction and relations between workers and managers in everyday work is the terrain upon which industrial relations take place. Understood this way, the NCM becomes a scientific object lending itself to interrogation by way of participant observation.

An Interpretative Epistemic Mode

With my research questions pointing towards the meaningful context of people's actions, interpretation must necessarily be the cornerstone of analysis. The interpretative work of this dissertation is inspired by Isaac A. Reed's concept of an *interpretative epistemic mode* (2011). Reed argues that *resignification* is the fundamental analytic operation, and while realist research resignifies observations in a coherent theoretical framework, interpretivist research resignifies observations into deeper understandings of the social context in which they took place. This has consequences for how theory is used.

The role of theory in this endeavor is to make it easier to see what goes on in the data, to "illuminate aspects of a meaningful social context (Reed 2011, 103)." Thus, the question is not whether the theory used for illumination is a true description of social reality in some general sense; the question deciding a theoretical concept's usefulness is whether or not it helps me gain a deeper understanding of the data at hand. The coherence in the analysis must come from the interpretation of the meaning in the case, not from a coherent theory supposedly referring to social reality. The use of theoretical concepts is therefore eclectic, in the sense that I draw on concepts from different theories.

Furthermore, while acknowledging that there is a world outside the case, external contexts matter only in how they are interpreted locally. The role played by capitalist

competition is decided by how local actors understand capitalist competition. In other words, external variables do analytic work only when they are unpacked as beliefs (Rhodes 2017: 18-19). The concept of regime is the (analytically constructed) space where the influence of external forces is decided through the interpretation of local actors. Both markets and institutions are examples of *environmental conditions* that matter (Barley & Kunda 2001), but *how* they matter is a question that must be answered by unpacking such external forces as local beliefs.

In addition to assisting the crafting of a narrative, theory also plays a role in delineating the research object by defining what it is I am investigating. This process of encasing, "sets some of the parameters for later theoretical work without predetermining the explanation (Lichterman & Reed: 593)." This setting of parameters has begun in this introductory chapter, and will addressed more broadly in the coming chapter on theory. In this process, and especially in doing interpretative analysis, Herbert Blumer's notion of sensitizing concepts is an instructive reflection on the use of concepts in social science. Sensitizing concepts "gives the user a general sense of reference and guidance in approaching empirical instances. Whereas definitive concepts provide prescriptions of what to see, sensitizing concepts merely suggest directions along which to look (Blumer 1954, 7). This is so because what is common in the data (what the concept refers to) "is expressed in a distinctive manner in each empirical instance and can be got at only by accepting and working through the distinctive expression (Ibid: 8)."

Ethnography

With an aim to understand meanings and practices, participant observation became the logical choice of method for data generation, with a goal to produce an *ethnography of Norwegian factory regimes.* While ethnography doesn't have a standardized meaning, here it is understood as designating both a method of data generation (participant observation + interviews) as well as a form of exposition (narrative) (Hammersley and Atkinson 2007). Participant observation entails research

taking place in "the field", that is, the setting for the research subjects' everyday life (Ibid.). In this case, data was generated on the shop floor of two firms by observation, informal conversation, and ethnographic interviews.

Explanation in an interpretative approach takes the form of narratives (Rhodes 2017). This narrative takes place at two different sites. It is not a story in the sense that it is fictional, but in the sense that standard literary conventions are used, in order both to make a "selection" of data from fieldnotes, and to present it as a narrative of interest to an outside reader. Thus, the text you are about to read is not structured mainly by theory and the language of dependent and independent variables. Rather, it is a tale forged from a multitude of observations and conversations into a coherent whole, which aims to provide narrative closure not by a successful conclusion to the plot, but by coherent description of a social structure (Thornton 1988, 1).

The Local and the Global

Traditionally, ethnography is held to be about the local and particular, doing a deep investigation in one place in order to understand what goes on there. This ethnography is an inquiry into Norwegian factory regimes, examined at two different sites. In this study, they are anonymized and go by the names of Safe Manufacturing and Metal Industries. Comparison between sites rests on the assumption that there is some explicit association or connection between them (Marcus 1995). The logic linking the two sites together in this case is their location within the same institutional framework, a framework thought to be conducive to a certain way of organizing class compromise at the firm level: the Norwegian cooperative model. Another commonality between the firms is their ability to compete on international markets. The function of these two contexts is to situate the sites in the wider world, to highlight what goes on at the sites. As Henrietta Moore puts it:

> [..] intellectually in order to foreground something it is necessary to have a background, so that smaller things are revealed only in relation to and as part of larger ones (2004, 2).

The Norwegian institutional context and global capitalism are thus used as backgrounds in order to cast into relief what is happening at Safe Manufacturing and Metal Industries. These contexts are what Thornton calls the "essential fiction" of ethnographic narrative:

> [..] these ulterior images of wholes are not directly accessible to either the author's nor his subject's experience. They can only exist in the imaginations of the author, her informants and her readers (1988, 287).

The analytic work that these fictions do, is to maintain a "productive tension between universal claims and specific historical contexts (Moore 2004, 1)." The idea of a specific way to organize class compromise at the firm level – the Norwegian cooperative model – together with Burawoy's notion of production regimes, make up the theoretical background of this investigation. While there are differences in the theoretical orientations of the concepts, they both thematize certain aspects of production: the forming of subjectivities in the labor process in the case of Burawoy, and the organization of the labor process and industrial relations in the case of the NCM.

Overview

This dissertation consists of eight chapters. This introduction has introduced the central empirical mystery that the research question sets out to answer, and explained why thick description and ethnography will be employed to answer it. Before diving into the narratives from the sites, it is necessary to develop the research questions further by constructing the research object. This will be done in the following chapter by drawing on my readings of Burawoy's concept of factory regime together with literature on the Norwegian cooperative model. Metatheoretical reflections will be discussed before assembling the conceptual apparatus necessary to investigate the factory regimes. Aiming at holistic understanding of local meaning makes it necessary to draw on a broad range of concepts from different fields. Concepts such as autonomy, hierarchy, authority, financialization and migrant work ethic are brought together – not because they make up a coherent theoretical framework, but because they are

necessary to highlight different aspects of the factory regimes. This analytic operation is done under Reed's (2011) slogan that the goal is coherent interpretation of local meaning, not coherence from a theoretical framework supposedly referring to reality. Chapter three will reflect on the methods used to generate the data upon which the narratives are based, and will discuss fieldwork, interviews and the analytical process.

Chapter four is the first of four analytical chapters and will unpack the imperative to accumulate capital as beliefs held by actors in the firms. Reconstructing these beliefs from fieldwork and interviews sets the stage for the further analysis by showing how the external conditions for reproduction are understood in the firms. This understanding will then form the basis of the further analysis, which shifts the focus to the firms' internal reproduction. Chapter five will explore the organization of the labor process in Safe and Metal. It will use concepts such as control and locus of authority to understand how and why the firms organize the labor process differently, and discuss the conditions for the reproduction of authority and how workers are interpellated. The discussion of the labor process enables the exploration in chapter six of how firms seek to mitigate labor cost, combining insights from chapter four and five in analyzing Safe's use of temporary workers and Metal's robotization efforts. Temporary workers and robotization are both shaped by and shape industrial relations at Safe and Metal. This will be the topic of chapter seven, where the lack of trust between the trade union and executives at Safe are contrasted with the cooperation at Metal.

The final chapter will bring together the issues from chapter four to seven in arguing that Safe and Metal are examples of two different types of factory regimes. The practices and relations discussed in previous chapters will be brought together to explain how these differing regimes are reproduced over time, answering the main research question by explicating the conditions for this reproduction. The findings will be positioned in relation to the claims of existing theory on the Norwegian cooperative model, before I continue with a normative reflection on the NCM, before ending with some suggestions for further research.

Chapter 2: Theory

In this chapter I will do several things, the most important being the development of the research question. While the RQ was introduced in the previous chapter, here I will put it in its proper theoretical context by demonstrating its roots in two different traditions: Burawoy's concept of *factory regime* and the literature on the *Norwegian cooperative model*. How firms are under an imperative to accumulate, and why the labor process is an important site for investigation, will also be discussed. Together, these discussions complete the *encasing* of the research object (Lichterman and Reed 2015). I will also discuss the metatheoretical reflections upon which the use of theory is based. From these reflections I will go on to discuss the conceptual apparatus used in the analysis of the factory regimes.

The analysis of data is a process driven by questions (Johannesen et al. 2018). While the main research question guides the analysis and this structures this dissertation, a host of analytic questions had to be deployed in order to craft the narratives from the two sites. While the concepts of factory regime and Norwegian cooperative model direct the general gaze of analysis, additional concepts were necessary to grasp the particularities of the different regimes. In order to do this, I have drawn on concepts from different strands of research, in line with Reed's slogan of coherence in meaning, plurality in theory (2011). The selection of concepts can therefore be said to be eclectic. What unites them, however, is that they play a role in elucidating meaning from the cases by assisting the interpretation of observations. They help with formulating *analytic questions* (Johannessen et al. 2018) that open up reflection on the different aspects of the regimes I observed at Safe and Metal, such as: the nature of compromise and cooperation, the role of migrant labor, and control in the labor process. The concepts discussed in the third section of this chapter, then, are what allows me to connect my data to the research objects of regime and cooperative model. They assist in constructing what Reed calls *maximal interpretations* (2011).

Encasing

The investigation in this project takes place at the point of production, the shop floor in two manufacturing firms. Firms, however, are not isolated entities, but pertain to the capitalist economy. To frame the sites in order to proceed with the investigation of what goes on there, it is therefore necessary to say something of the dynamics of capitalism, as this is the dynamic in which firms find themselves. According to Marx, and later Schumpeter, capitalism is a highly dynamic system. In the *Marx-Schumpeter* theory of innovation (Fagerberg 2003), the tendency in the capitalist economy is constantly towards disequilibrium and uneven development. Imbalances in the system grow from the economy itself, and not only from events or institutions "outside" the economy. A source of this instability is innovation emerging out of the process of competition between capitals. Schumpeter referred to this as a process of creative destruction (Schumpeter 2008). It is this continuous process that firms in the capitalist economy find themselves in. They are in the same situation as the Red Queen in Lewis Carroll's *Through the Looking Glass* (1991, 14):

> "Now, here, you see, it takes all the running you can do, to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!"

In the capitalist economy, accumulation is not a choice, but an imperative (Wood 1999). A firm cannot choose not to compete in the market; or, it can, but that will jeopardize its ability to reproduce itself as a firm. It is the mechanism of market competition that makes continuous expansion of capital (accumulation) into an imperative. A capitalist who hoards his profits from production while other capitalists re-invest, will soon find himself out-competed and joining the ranks of the working class. As Marx put it in *Capital*:

> "This boundless greed after riches, this passionate chase after exchange-value, is common to the capitalist and the miser; but while the miser is merely a capitalist gone mad, the capitalist is a rational miser. The never-ending augmentation of exchange-value, which the miser strives after, by seeking to

save his money from circulation, is attained by the more acute capitalist, by constantly throwing it afresh into circulation (Marx 1976, 254-255)."

Hence, the capitalist firm finds itself in perpetual motion. However, the shape taken by accumulation cannot be deduced from theories of capitalism, but must be investigated concretely. What interests me in this investigation, particularly in chapter four, is the unpacking of the imperative to accumulate as a belief held by people at the sites.

Analyzing the Labor Process

Labor process theory (LPT) is a tradition of industrial sociology focusing on work at the point of production. It is used more widely in the UK and the US than in Norway, where the socio-technical tradition has been stronger. I introduce it here both to situate Michael Burawoy's work in the tradition, and because I want to use concepts from it both for *encasing* and *analysis*. When Marx used a large part of *Capital Volume One* to discuss the labor process, it was because he saw labor as the source of value in capitalist production[4]. Labor process theory therefore privileges the labor process as the site of investigation. In this study, I am interested not primarily in the production of value, but in the production of subjectivities, or people, as Burawoy formulates it.

For Marx, the labor process has three elements: first, work itself, understood as purposeful productive activity; second, the things on which work is performed; and third, the tools that facilitate the process of work (Bottomore 2001). The process is one of transformation: the labor of the worker is transformed into a concrete commodity (or service). Harry Braverman took Marx's concept of labor process as his starting point in the now-famous *Labor and Monopoly Capital* (1974). The book renewed interest in the nature of work, and became an important foundation for the emerging LPT tradition (Smith 2015).

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[4] There is a large debate on Marx's labor theory of value, and whether it is necessary as a basis of labor process theory. That debate is outside the scope of this dissertation. Brief overviews can be found in Jaros 2005 and Böhm & Land 2012. For a discussion of Marx's labor theory of value, see Carchedi in *Routledge Handbook of Marxian Economics* (2017).

Braverman argued that the imperative to accumulate and the striving for efficient production that followed from it led to a need for capital to control workers in the labor process. Managerial control of the labor process was achieved by a separation of conception and execution. The managers were tasked with knowing what was going one, making decisions, judgments, and everything having to do with the conceptual side of work. Workers, on the other hand, were to do as instructed. The production ideology that best expressed capital's interest was, in Braverman's view, the scientific management of Fredrik Taylor. To Braverman, the ideal organization from capital's point of view was one where:

> "[..]the worker possesses no basic skill upon which the enterprise is dependent and no historical knowledge of the past of the enterprise to serve as a fund from which to draw on in daily work, but rather where everything is codified in rules of performance or laid down in lists that may be consulted (by machines or computers, for instance), so that the worker really becomes an interchangeable part and may be exchanged for another worker with little disruption (Braverman 1994, 24-25)."

Braverman characterized what happened to the workers, and was not interested in the agency of the members of the working class. By his own admission, he was only investigating the "objective" side of work, something for which he was criticized, a critique, interestingly enough, he himself foresaw: "[..] the omission of the 'subjective' will, I fear, hopelessly compromise this study in the eyes of some of those who float in the conventional stream of social science. (1974, 27)."

One critic of this omission was Michael Burawoy, who at the time of publication of *Labor and Monopoly Capital* was busy doing fieldwork, working as a machine operator in a diesel engine factory. The central question for Burawoy was not the "objective" degradation of work, but the participation of the workers in their own subordination: "That, and not the destruction of subjectivity, was what was so remarkable (1985, 10)." To understand how this could happen, Burawoy turned to theories of politics and

ideology, conceptualizing the order of things inside the factory gates as a *regime*, and looking to understand the "subjective" side of work.

Factory Regimes and Production Regimes

Michael Burawoy developed the concepts of production regime and factory regimes in order to explain his experiences from the shop floor, arguing that the labor process was central to the formation of worker subjectivity, a notion he shared with the pioneers of sociotechnical studies. In *The Politics of Production*, Burawoy defines *production regime* as the political effects of the labor process combined with the *political apparatus of production* (1985). The latter consists of the institutions regulating relations between workers and management.

> "Thus, collective bargaining concretely coordinated the interests of workers and management, the grievance machinery constituted workers as industrial citizens with rights and obligations, and the internal labor market produced a possessive individualism [..] on the shop floor (1985, 10)"

Burawoy sees commonalities between the factory and the state, drawing on theories of politics to understand what goes on in the factory. Hence, the political apparatus of production becomes a parallel to the state apparatus in wider society.

The concept of production regime, then, covers both the effects of the labor process as well as the political apparatus of production. In *Politics of Production*, Burawoy draws on fieldwork in the US, the USSR and Zambia to theorize production regimes of advanced capitalism, socialism and post-colonialism. This short outline shows the high theoretical ambitions of Burawoy's work, aiming to say something of not only local factory regimes, but global capitalism. My ambitions here are much more modest. Hence, it is necessary to make a few adjustments to the concept of production regime.

A problem with Burawoy's theorization of production regimes is that he uses an American firm to represent the entirety of what he calls advanced capitalism (see for example Thompson and Newsome in Kaufman (ed) 2004). Today, *varieties of capitalism* (Soskice and Hall 2001) has become a field of research in its own right,

making Burawoy's generalizations appear far too broad. It is therefore necessary to adjust the concept of production regime to the Norwegian variety. While there are vast differences between Norwegian and American working life, for my purposes the most relevant difference is the centralized character of both collective bargaining and grievance machinery. In the Norwegian institutional framework, collective bargaining involves revising collective agreements, which contain what Burawoy refers to as grievance machineries. Hence, collective bargaining and grievance machinery is part of the institutional context for both Safe and Metal. My analysis will concentrate on the political and ideological effects of the labor process, but where Burawoy is interested in wider working-class struggles, I will limit myself to industrial relations in the firms.

Another problem with the concept of production regime is that it may overestimate the power of the consent produced in the labor process. Rick Fantasia poses such a critique in *Cultures of Solidarity* (1988), arguing that grievances also engender resistance on the shop floor. Burawoy acknowledged this critique, and saw it as related to how he kept external factors stable, and made the production regime more static than it should (2004).

And while Burawoy represented a turn to the subjective side of production from Braverman's "objective" focus, O'Doherty and Willmott have criticized him for not going far enough in this direction (2001). When this dissertation draws on Burawoy's work, it is because I agree with O'Doherty and Willmott that acknowledging workers' subjectivity enables an analysis of how relations between capital and labor look and are reproduced or challenged at the point of production (Ibid.). Burawoy's concepts offer a fruitful way of doing this. For my purposes, I will adjust the concept of factory regime as mentioned above by disregarding collective bargaining and grievance machinery, and concentrating on the ideological effects of the labor process, and industrial relations. The organization of the labor process and industrial relations, and how these might be related, will thus be at the center of my understanding of factory regime.

Control and Conversion

Burawoy's work on production regimes is related to debates over control in the labor process. At the "core" of labor process theory, it is held that control is necessary to ensure conversion, as market mechanisms by themselves do not alone regulate the labor process (Thompson & Smith 2010)." The view of the labor process as needing regulation is related to several other concepts. Labor power is an individual's capacity to work, while actual labor is what gets done during the working day (the amount of time the capitalist has bought the workers labor power for). The coercion of the market (fear of unemployment) is not enough to ensure the worker will work at full capacity for the working day. The transformation of labor power to actual labor is referred to as the process of *conversion.* The capitalist then, has an interest in as high a rate of conversion as possible.

In the Fordist era, the scientific management of Frederick Taylor was considered by many as the answer to this. Since the 1980s, answers such as the ones provided by the Toyota model or Lean manufacturing have become more widespread. The varying popularity of different managerial ideologies also underlines a central point in the contradictions between labor and capital, namely that how this contradiction is expressed in particular firms is not given. Rather, "a range of circumstances and contingencies intervene between the deeper tendency of labor to be managed in the interest of capital, and the actual practices that are followed" (Watson 2003: 63).

As this investigation looks to understand how employees and managers interact in the labor process, as well as how the labor process is controlled, some concepts to describe control are needed. Richard Edwards formulated three strategies organizations used to control members' activities (Edwards in Fischer and Sirianni (eds) 1984; see also Barker 1993): Simple control is direct and personal control: the boss tells the worker what to do. The second form, technological control, is when control is embedded in the physical design of machinery in production, such as the assembly line. The third form of control is bureaucratic control, where control is embedded in the formal rules

of an organization, "in the contrived social relations at the point of production (Edwards in Fischer and Sirianni (eds) 1984, 93)." For Edwards, these different types of control represent different stages in the historical development of capitalism. But, as the evolution of capitalism is uneven, all of the three types might co-exist at the same time in different firms.

Tompkins and Cheney formulated the concept of *concertive control*, based on Edwards' earlier typology (1985). Concertive control differs from the three preceding forms of control in that workers control themselves. Rather than being ordered around by the manager whose authority is grounded in the bureaucratic rules of the organization, the workers negotiate a consensus between them on how to shape behavior (Barker 1993). In a labor process organized on the principle of concertive control, *the locus of authority*, the authority workers are willing to abide (Whitley 1977), is transferred "from the bureaucratic system and its rational-legal constitutive rules to the value consensus of the members and its socially created generative rules system (Barker 1993: 6)." In investigating the NCM, which is supposed to be characterized by a labor process populated by autonomous teams, the concepts of concertive control and locus of authority will be used to describe how control and coordination is achieved in production.

Workers who are delegated a degree of responsibility for tasks are often referred to as autonomous (see for example Rasmussen 2007 in Hjellbrekke, Olsen and Sakslind (eds)). The concept of autonomy is used in a variety of ways, both descriptive and normative. In literature on the NCM, autonomy is sometimes seen as an integral part of how Norwegian working life is, and should be, organized. At Metal Industries, autonomous teams are the way the organization of work is described, testifying to the influence of the normative aspect of the concept. For analytical clarity, I will stick with the concepts describing different ways of controlling what workers do. This makes it easier to maintain analytical distance to Metal Industries' autonomous teams. Furthermore, the concept of autonomy risks obscuring the fact that control in some

sense is necessary in capitalist production. Autonomous workers are autonomous within certain parameters, and in the last instance, the imperative to accumulate is what defines the parameters for autonomy. This is not to say that autonomy is not worth fighting for, or represents an improvement of conditions for workers (Friedman 1977). It is to say, however, that autonomy of work in capitalist firms is subjected to the imperative to accumulate (Falkum 1998). Therefore, it seems the more fruitful way to understand autonomy as a means of control, as the concept of concertive control helps do. This does not exclude the possibility that concertive control might be the preferred way to organize work from the point of view both of management and workers. The notion of autonomy as beneficial to both labor and capital is a notion that sits well within the theoretical tradition I shall now turn to – the Norwegian cooperative model.

The Norwegian Cooperative Model

One way to understand the concepts of Norwegian model (NM[5]) and Norwegian cooperative model (NCM[6]) is to see them as ways to explain an anomaly: How is it possible for Norwegian manufacturing firms to succeed in global competition? One would think that robust environmental regulations and high wage levels, especially for blue-collar workers, would make business leaders outsource production to low-cost countries. While this has happened to some extent, it has not meant the total removal of manufacturing from Norway. A central idea in literature on the NM and NCM is that co-determination and cooperation go hand in hand with competitive advantage (see for example Levin et al. 2012). This idea is both a focus of research in what Falkum (1998) has called the "cooperative tradition", and at the same time an idea that has influence in Norwegian working life, by informing actors' understanding of reality (Ibid.). The "cooperative tradition" is central to the understanding of the NCM, and it is this literature that is the primary focus in the following.

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[5] institutions
[6] firms

To understand the roots of the idea of cooperation on the local level, it is necessary to have an idea of developments on the level of national institutions. Therefore, I will give a brief overview of the institutionalization of Norwegian working life, before discussing how this helps frame this study.

The Norwegian economy is an example of what the *varieties of capitalism* literature calls a coordinated market economy (Soskice & Hall 2001), characterized by government coordination of the economy and collective actors. The specific configuration of working life institutions has developed historically since the end of the 19th century. The largest trade union confederation, LO[7], was established in 1899, and the employer association NAF[8] (later NHO) was established the following year. The beginning of the century was a period of transition from an unregulated to a regulated working life (Seierstad 2011). A central part of this process was the negotiation of collective agreements with sectors of industry as its scope rather than individual firms. The first, the *Workshop Agreement* [Verkstedoverenskomsten], was signed in 1907 between NAF and the Workshop Union [Verkstedforeningen]. This was the first step in a development towards nationally coordinated agreements, setting Norway on a different path than economies such as the US and Japan, who typically have agreements between labor market parties within firms (Seierstad 2011).

In 1915 the *Act on Labor Disputes* [Arbeidstvistloven] established the practice of state intervention in the struggle between capital and labor. The trade unions were recognized as the representatives of workers in the firms, while the owners were conceded the right to control the labor process [*styringsrett*]. This was a crucial step in the beginning institutionalization of Norwegian working life (Seierstad 2011). The 1935 basic agreement between LO and NAF greatly increased regulation of Norwegian working life. It called for voluntary arbitration of conflict, and has since been continuously renegotiated. Thus, the basic agreement between LO and NHO, and its

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[7] Norwegian Confederation of Trade Unions
[8] Confederation of Norwegian Enterprise

continuous renegotiation, represent the formalization of relations between workers and employers (for a detailed overview, see Seierstad 2011).

After the Second World War, cooperation between LO and NAF increased in an environment characterized by an ideology of cooperation and a belief in economic growth (Buland, in Nilssen (ed.) 1998). In 1962 the Joint Committee for Research for Cooperation[9] was formed. Among its tasks was to test alternative forms of work organization (Gustavsen et al. 2010). A central figure in this endeavor was the psychologist Einar Thorsrud. The experiments in industrial democracy, as they came to be known, were inspired by the work of the British Tavistock Institute, but Fred Emery and Einar Thorsrud point out that in Norway the industrial democracy projects had a much wider institutional involvement than in Britain (Emery and Thorsrud 1976).

An important motivation behind the experiments was the democratization of working life by increasing the influence of workers (Karlsen and Munkeby in Nilssen (ed). 1998). Thorsrud argued that representation would not "trigger the human resources firms needed (Ibid.: 40)." Instead, influence over work would be better placed in the labor process, as influence over the daily practice of work, rather than in the boardroom. A common idea between Thorsrud and Burawoy, then, is the importance given to the labor process and workers' experience of it.

During the 1960s, a "first wave" of experiments in industrial democracy was undertaken. The goal was to demonstrate that ways of organizing the labor process in which workers had a larger say was an efficient way to improve the organizations. It was argued that autonomous work-groups, job rotation, and other organizational innovations would make work both more interesting and rewarding, leading to increasing efficiency (Karlsen and Munkeby, in Nilssen (eds). 1998). In this there was an inherent critique of the main way of thinking about industrial organization at the time, namely the scientific management of Frederick Taylor. Gustavsen et al. (2010)

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[9] My translation of Felleskomiteen for samarbeidsforskning

argue that the industrial democracy projects should be understood as part of a wider trend in which alternatives to scientific management were developed, in Japan, in the US, and in Northern and Western Europe. Unique to the latter stream of such attempts was a focus on participation as a value in itself, not only as a means to an end (efficiency).

The theoretical superstructure of the industrial democracy projects was socio-technical systems theory (STS), originating from a study of coal miners in England (Trist and Bamforth 1951). Studies of coal mines in England found that mechanization led to high levels of stress among workers and reduced performance. Small groups of workers were dissolved to better fit the demands of the machinery. The result was that workers who before had a variety of tasks now had one task each, in an organization of work with different piece-rate regimes (Herbst 1976). Groups of workers sought to optimize their own output in accordance with piece rates, with the result being that conditions became sub-optimal for other groups, resulting in "competitive individualism (Ibid: 11)." In the language of the STS theory that would develop from these studies, this was an example of the technological system being optimized without concern for the social system. A central insight in STS was that joint optimization was imperative to achieving both efficiency in production, and welfare for workers (Herbst 1976). For the leading theoretical figures behind the industrial democracy experiments, the advantages of industrial democracy and joint optimization were seen as strong enough to engender their spread throughout working life (Herbst 1976). This did not happen (Qvale 2002). The aim of *national reform of working life* was not achieved. Still, some of the ideas of the experiments found their way into reforms on the national level. Attention to the psychological side of work informed §4[10] in the new law on working environment which was approved in 1977 (Gustavsen et al., 2010). In addition, during the 1982 negotiations between LO and NAF an additional agreement was reached, the Agreement on Development[11], with the goal of enabling cooperation between labor

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[10] In the original law, this was found in §12.
[11] English translation from Payne and Keep, in Harley, Hyman and Thompson (eds) 2005.

market parties for firm development. The agreement has rules for how trade unions and employers can co-operate on enterprise development and adds legitimacy to such efforts (Payne and Keep, in Harley, Hyman and Thompson (eds) 2005). Thus, one can draw a line from the establishing of a joint committee by LO and NAF to guide industrial democracy research, to negotiated agreements on such issues several decades later.

During the 1980s, the justification for workers' participation and co-determination changed. Democracy went from being a goal in itself to being justified because it made production more efficient (Heiret 2012). The notion that cooperation led to efficiency has since been contested (see Reve 1994). Still, in one sense the 1980s was a breakthrough for the ideas of industrial democracy. A royal commission tasked with reviewing the status of industrial democracy and coming up with suggestions for improving it saw participation from all major labor market organizations (Qvale 2002). The commission proposed a national program for increased participation, with a goal of increasing productivity (NOU 1, 1985). Hence, the 1980s might be seen as both success and failure for the ideas behind the industrial democracy experiments of the 1960s. The goal of society-wide democratization was relegated to the background, but the focus on participation in the everyday practice of work became mainstream.

During the 1990s, management concepts such as *Just in time* and *Top quality management* emphasized the idea of involving individual employees by delegating responsibility (Olsen 2003). A survey (Colbjørnsen in Falkum et al (eds) 1999, 23) found that 37 percent of Norwegian employees reported better opportunities for taking decisions themselves compared with two years prior. While the slogans might not necessarily be the cause of this, they do seem to have reflected actual changes taking place in Norwegian working life (Olsen 2003). Another survey found that 30 percent of private companies reported organizational changes involving more responsibility to employees (Colbjørnsen 1999, 25). As Olsen (2003), points out, these trends became intertwined in the existing configuration of working life in Norway. That is, they

became intertwined in the model of cooperation between trade unions and management.

The concept of Lean is an illustrative example of such a process. Since the 1990s, Lean as a guiding principle for the organization of production has become widespread among Norwegian manufacturing firms. *Lean Forum Norway* was established in 2009, with the goal of contributing to innovation and firm development. A central part of its work is "research and development of the Norwegian model and Lean philosophy (leanforumnorge.no/om-oss)." The initiative came from the central trade union confederation, LO, and the largest employer association, NHO, together with researchers and consultants (Ingvaldsen et al. 2012). This illustrates the "intertwining" of management trends into the ongoing cooperation between labor market parties which Olsen observed in the 1990s. Since Lean was popularized by books such as *The Machine That Changed the World* (Womack et al. 1990), it has been controversial. Dankbaar (1997) argues that it is but Taylorism in disguise, extending the influence of the ideas of Fordist mass production, including the separation of execution and control. This would seem to contradict the principles of the NCM, where delegation of responsibility to workers is held to be advantageous. Moldaschl and Weber (1998) argue that the concept of continuous improvement in Lean amounts to a form of self-rationalization on the part of workers. Paul S. Adler (1995, in Babson (ed)), on the other hand, argues that Lean should be understood as a democratic form of Taylorism, emphasizing workers' participation in the definition of work methods in procedures. A reason for Lean's successful "intertwinement" into cooperation in Norway might be the focus on the flattening of hierarchies, group work, and task integration, which was also important in the experiments in industrial democracy in the 1970s (Moldaschl & Weber 1998). Ingvaldsen et al. (2012) argue that Lean in the Norwegian context represents both challenges to autonomy by way of standardization, as well as opportunities for increased codetermination.

In 1998 Karlsen and Munkeby described the central characteristics of the NCM in the following way: 1. Cooperation between trade union and management for development (of the firm). 2. Codetermination for employees in various ways. 3. Cooperation with researchers for firm development and making participation more efficient (Karlsen and Munkeby in Nilssen (eds.) 1998). A decade later, a royal commission described Norwegian working life on the firm level in a similar way, emphasizing cooperation, codetermination and labor laws ensuring workers' rights while also underscoring the duty of workers to contribute to the work environment (NOU 2010, 1: 23). In 2012, a book with the title "Democracy in Working Life – The Norwegian Cooperative Model as Competitive Advantage [12]" was published (Levin et al.). Here the NCM was understood as an example of *employee-driven innovation*: the active participation of employees in developing products, services, and new processes (2012: 135). Hence, a central aspect of the model was that it engendered employee participation in innovation processes. Related to this was the relative independence of workers in production processes, seen as conducive to innovation and firm development (Levin et al. 2012; Ravn, in Bungum, Forseth and Kvande (eds.) 2015). Finsrud and Moen argued that the organizational form of autonomous teams in particular contributed to the competitive advantage Norwegian firms (2012; see also Gustavsen 2007). In a recent publication, Hvid and Falkum equate democratization of work with "autonomy and learning opportunities for individual workers and groups of workers (2019, 51)."

When I have spent some time on the concept of the Norwegian cooperative model and the discussion of it here, it is because I want to show the persistence of some ideas over time, as well as the integration of new concepts into this discourse, such as Lean and EDI. This is no attempt at a systematic literature review, but it is an effort to show that a relative degree of independence in the labor process (autonomy) and cooperation between trade union and firm are central to the idea of the NCM. The discourse on the NCM is not limited to researchers, but have participants from labor

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[12] Demokrati i arbeidslivet – Den norske samarbeidsmodellen som konkurransefortrinn.

market parties and government, as illustrated by the NOUs and the concept of EDI, which originated from the Danish LO (Sørensen et al. 2014). The NCM and the discussions it encompasses therefore have both descriptive and normative elements. In this study, I am interested in comparing the ideas from the NCM with the observations from the shop floor in Norwegian manufacturing. In order to do that, I construct a heuristic device from my readings of Burawoy and the NCM literature quoted above.

Revisiting the Research Questions

I have demonstrated how, in what Falkum (1998) calls the *cooperative tradition*, the literature maintains that independence in the labor process and cooperation for firm development is central, and how concepts such as Lean and EDI have been integrated into the tradition. With the concepts of factory and production regimes, Burawoy emphasized both the subjective side of work and its importance for reproduction of relations in production. When aspects of production are connected to form a stable *modus vivendi* between workers and managers, it is possible to talk about a factory regime. A production regime is when a factory regime becomes typical or central within an institutional context. The literature on the NCM argues for the prevalence of a typical regime among Norwegian (manufacturing) firms, namely, a regime characterized by autonomy in the labor process and cooperation or firm development between trade union and firm. Hence, it is possible to talk about a Norwegian production regime, at least on the basis of the NCM literature assembled here. "Firm development" is a rather abstract concept, requiring some specification to be useful in investigating working life. In this investigation I will limit myself to firm development, understood as mitigation of high labor costs, based on the assumption that a central challenge for manufacturing firms in Norway is the high wage cost. Firms compelled by the imperative to accumulate would need to mitigate this in some way, either by reducing the amount of labor used in production, for example by increasing automation, or by numerical flexibility. Another way to mitigate high wage cost could

be to increase the utility of labor, by harnessing worker knowledge for innovation by way of employee-driven innovation.

Based on the preceding encasing and development of the theoretical context of the questions asked by this dissertation, it makes sense to re-state the research objective, to understand: *why factory regimes differ between Norwegian manufacturing firms involved in global competition?*

The regimes of the firms will be elucidated by asking four additional questions that highlight four central aspects of the regimes.

1. Why do the firms employ different strategies to accumulate capital?

2. How is the labor process controlled and coordinated, and what ensures the reproduction of authority?

3. Why do the firms employ different means to reduce labor expenditure and raise labor value?

4. Why do industrial relations differ between the two firms?

These four questions will be answered in chapters four to seven, before they are brought together in the final chapter by using the notion of reproduction to understand why the regimes differ. These four questions necessarily involve answering both "how" and "why" questions, as it is necessary to first describe the different aspects before going on to explain why they differ. To understand why the characteristics of the firms are sustained over time, it is also necessary to understand how they are continuously reproduced. The final chapter will draw on the previous chapter to demonstrate how these different characteristics of the firms can be fruitfully understood as different regimes, since the aspects highlighted are not isolated, but mutually reinforce each other to various degrees. As is clear from the preceding theoretical discussion, this dissertation's primary focus is on the internal conditions for reproduction, discussing external conditions only as they are interpreted in the firms. With this construction of

the research object completed, I will now turn to the metatheoretical reflections upon which the use of theory stands.

Metatheoretical Reflections

Like many interpretative research projects, this one takes Clifford Geertz's famous quote as its starting point:

> Believing, with Max Weber, that man is an animal suspended in webs of significance he himself has spun, I take culture to be those webs, and the analysis of it to be therefore not an experimental science in search of law but an interpretive one in search of meaning (Geertz 1973, 5).

This project is thus out to do as Geertz advised in order to understand meaning, to do "thick description". Here it is understood as describing not only what people do in detail, but seeking to understand why they do it, by understanding the symbolic context of the action in question. As this context is not readily available to the researcher, doing thick description is a question of continuously seeking deeper understandings of actors' actions.

This dissertation, however, does not share Geertz's demarcation between science aiming to understand, and science aiming to explain. My ambition here is to interpret and understand meaning and use these interpretations in causal explanation. It therefore seeks to go beyond the traditional dichotomy between understanding and explaining, where the former is seen to be the goal of (social) constructivist science, and the latter the goal of positivist science (for an argument for this separation, see Taylor 1971).

In order to make causal claims from interpretative analysis, a different understanding of causality is necessary. Reed draws on the work of Donald Davidson to argue that reasons can be causes[13] and part of causal explanation (Davidson 1980). If we know that an actor wants something, and that s/he holds a belief that a particular course of

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[13] For an argument against the idea that reasons can be causes, see Winch 1964.

action will lead to such an outcome, s/he has a primary reason for action, according to Davidson. But what are good primary reasons for one actor might not be good primary reasons for another. Thus, Davidson makes a break with the demand that explanations must be formulated as precise laws valid for all instances of a phenomenon. The reasons of actors are subjective, and future actors might hold different views entirely. And in order to grasp these subjective reasons, interpretation of the meaningful context of actions becomes necessary. (For a thorough discussion on the possibility of uniting understanding and explaining, see Reed's *Interpretation and Social Knowledge* 2011). When reasons can be causes, the realm of social meaning becomes the natural starting point for causal explanations, as reasons and intentions by their very nature are part of universes of meaning. The quest for causal explanation is thus also a quest to interpret meaning and do thick description.

On the Use of Theory

In order to interpret and formulate causal explanations, it is necessary to draw on theory. At least if the goal is to communicate with other researchers. Theory is "the language game that binds together what C.S. Peirce would have called communities of inquiry (Lichterman & Reed 2015, 588)." Theory also helps with delineating the research object, defining what exactly it is we are investigating, a process that "sets some of the parameters for later theoretical work without predetermining the explanation (Ibid, 593)." The literature used to achieve this goal will be discussed shortly. Before that, it is necessary to say something about how theory will be used to do the later theoretical work, the work of analysis.

Inspired by the work of Reed, this dissertation will use theory in the *analysis part* of the dissertation in an eclectic manner. By this I mean that I am not out to construct a coherent theoretical framework for sorting and analyzing the data. Instead, I will draw on concepts from different theories. The relevant question put to these concepts will not be whether they fit epistemologically with other concepts used in analysis. Rather, the criteria on which the relevance of an analytic concept is judged is whether it helps

with understanding the data at hand, the idea being that interpretative analysis is about "plurality in theory, unity in meaning (Reed 2011, 100)." To unpack this statement, a short overview of the concept of interpretative epistemic mode is necessary.

According to Reed, the difference between epistemic modes is how they put evidence into contact with theory. In the realist epistemic mode, which Reed contrasts with the interpretivist one, theoretical schemes are used to order and explain observations (Reed 2011: 91). The social actions under study are *resignified*; they are taken out of their original context and placed in a theoretical context or *conceptual space* (Ibid.). This theoretical framework aids explanation because it is thought to correspond to an existing social reality. In the realist epistemic mode, "theory, by referencing a new world, enables us to comprehend the evidence as the expression of something both deeper and more general (Reed 2011, 91)." Theory, then, and coherent theoretical frameworks, are what enables the researcher to make sense of the data at hand, and to make generalizable truth claims. The interpretative epistemic mode brings facts and theory together in a different way.

In the interpretivist epistemic mode, resignification is also an important step in analysis. But the resignification is not from facts to a coherent theoretical context. Rather, facts are resignified into a deeper understanding of the case at hand, which is still historically and socially specific. That is, the aim is not universal generalization, but to make claims of the symbolic order "in a way that remains within the orbit of the social actions under scrutiny (Reed 2011, 92)." Thus, facts are moved from their original context, not into a theoretical framework which is believed to refer to the *Real*[14] structures of the social, but into another set of meanings that, according to the researcher, also exist in the case. This is what Reed designates as interpretivism.

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[14] Roy Bhaskar's stratified reality, the domain of the Real.

The theoretical consequences of interpretivism differ from the realist epistemic mode. The preference for a coherent social theory that is believed to refer to the world as it really is, is left behind. Instead, "the social [..] emerge on what I will call landscapes of meaning. These landscapes are historically particular [..], and yet can, in some cases, extend through large swaths of time and space. (Ibid.: 92)." Instead of using a theoretical framework to understand and sort facts, the interpretivist researcher uses different theories to understand different aspects of what is going on in the case. The relevant criteria for theory selection are not whether it fits the general theoretical framework or otherwise is thought to be a true description of the social.

> Instead, theories are used to illuminate aspects of a meaningful social context, regardless of whether these theories are true as descriptions of the social in some general sense, and the coherence of the maximal interpretations derives from the coherence of background meanings interpreted to be surrounding the social actions under study, and not from the coherence of the social theories mobilized to achieve this understanding. The coherence is *in the case*, not in the theorist's head. (Reed 2011, 103).

It is not the theoretical framework, then, that should be coherent, it is the interpretation of the case at hand. And for this interpretive effort, a multitude of theories can be brought to bear on the research object. Gramsci's concept of *hegemony* will be explained later on and serves to illustrate the point; I am not concerned with whether it refers to the world in some general sense. The reason for it being used on my data is because it contributes to a deeper understanding of the data at hand, by helping me make sense of how class compromise is sustained. Hegemony is used to propose a fruitful way of understanding what is going on in the case. It is used as a metaphor, proposing that the relations between abstractions in my case such as workers, executives, firms or class compromise, are similar to the relations between abstractions in another case (Gramsci's study of political power).

Under the heading "Towards a Research Question" in the previous chapter, I showed how the research question came about in a continuous negotiation between data and

theory. Hence, the encasing was not an operation done once and for all at the beginning of the research, but involved casing and later re-casing as the object of investigation became clearer with deeper interpretations of the data and more coherent narratives. Most of the theory discussed in this chapter has therefore been assembled over the course of analysis. This process involved gaining a deeper understanding of the data, but also a clearer understanding of the theoretical concepts used to make sense of the data. This analytic process has been aptly described by Emerson et al.:

> The process is like someone who is simultaneously creating and solving a puzzle or like a carpenter alternately changing the shape of a door and then the shape of the door frame to obtain a better fit. (Emerson et al. 2011, 173)

An important part of getting the door to fit the frame in this study was the comparing of the firms to each other. Comparison was inspired by Marcus's notion of *multi-sited ethnography,* where "comparison emerges from putting questions to an emergent object of study whose contours, sites and relationships are not known beforehand [..] (1995, 102). Through formulating new questions, answering them and then moving on to new questions, a heuristic device for comparison was developed, at the intersection between Burawoy's concept of regime, literature on the NCM, and the data from the two firms. Much of this has already been discussed in the first part of this chapter with the discussion leading up to the revisiting of the research questions. The main research question was operationalized by more specific questions, putting the imperative to accumulate, the labor process, labor cost mitigation and industrial relations into focus, based on a reading of literature on the NCM and Burawoy's notion of regime. These questions need additional concepts in order to do what Reed (2011) maintains is a central task of the researcher, namely to put observations into contact with theory in order to produce maximal interpretations.

Concepts Used to Ask Analytic Questions

In order to understand the factory regimes, it was necessary to deconstruct the concept into its component parts: the additional research questions. This section will execute another deconstruction, enabling the reconstruction of observations and interviews from the shop floor into narratives that together answer the research questions. This is because the concepts used in encasing is not sufficient to grasp the data used to answer the research question. In comparing apples and oranges, it is necessary to highlight what one considers the important features of the apples and oranges. By drawing on my reading of Burawoy and literature on the NCM, I have argued for why I find the imperative to accumulate, the labor process, labor cost mitigation and industrial relations the important features of the factory regimes, in the same way as one might argue that color is a vital characteristic when comparing apples and oranges. In order to explain why the color is different however, it might be necessary to delve into the micro level chemical characteristics of the peel of the fruits. The concepts introduced in this section perform such a function, allowing me to answer the questions of how and why the firms differ on the four different characteristics. The concepts are drawn from different theoretical tradition, and can therefore appear as eclectic. For the answering of my research question, however, they comprise a tailor-made conceptual apparatus designed to elucidate the *coherence of the meaning in the case* (Reed 2011). Hence, it is this conceptual apparatus that allows for answering the research questions, and contribute to research on Norwegian working life by understanding why some firms adhere to the script of the NCM and others do not.

The Worker Collectivity

The worker collectivity[15] is a concept coined by the Norwegian sociologist Sverre Lysgaard, based on his research at a paper mill in the Norwegian city of Moss in the late 1950s (2014). The worker collectivity (TWC) is a form of worker collectivism, a

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[15] The initial way to translate *Arbeiderkollektivet* into English would be "the Worker Collective". However, as all the literature in English on Lysgaard's work has used the Worker Collectivity, I will follow this lead in this dissertation.

system of norms and ideas that grows from the needs of the workers in the factory and enables them to act in unison. Lysgaard understands the factory setting as comprised of two systems, the technical-rational and the human system. The technical-rational system is the need of the firm to make a profit, or to accumulate, and its hierarchical organization and technical demands of production. The technical-rational system is characterized by its lack of limits, its insatiable demand for labor from the workers. It represents the manifestation of the imperative to accumulate capital on the level of the firm.

The human system, on the other hand, consists of the blue-collar workers at the factory, the bearers of labor power. In themselves they have a variety of needs in order to develop their humanity, needs that sometimes contradict the insatiable need of the technical system for their labor power. Since the capacity of the workers is limited, they need some protection from the technical-rational system. It is from this predicament the worker collectivity grows forth. When a hierarchical structure acts on behalf of the technical-rational system, a worker collectivity might evolve as a dynamic system of protection on the part of the workers.

Lysgaard uses the concepts of *identification* and *interpretation* to describe the formation of the worker collectivity. Through work, workers are being brought together, both spatially and socially. They have breaks together, they interact in the performance of certain tasks, and so forth. An outcome of this interaction is that workers recognize who they are similar to, or different from. People who see each other as equal will tend to interact more. A process of identification takes place, where workers recognize each other as similar or equal. On this basis, a process of (collective) interpretation can take place in which workers reflect on their common situation, the way work is organized, the relation between subordinates and superiors, legitimacy of demands, and so forth. Out of this process of collective reflection might arise ideas on how to behave in order to change what is perceived as unjust and bring about what is just. If these ideas are acted upon in practice and over time, norms regulating behavior

develop. According to Lysgaard, clusters of such interconnected norms make up an ideology, an ideology with the power to act back on the processes that created it in the first place – identification and interpretation – so that it reproduces itself over time.

When Egil Skorstad visited the same paper mill in the 1980s, he found that the work processes that had generated the most conflict had been automated (Karlsson et al. 2015). Automation had led to fewer workers, but since workers were now together in control rooms, conditions for interaction and identification were still present. However, institutional changes had led to the formalization of interaction between management and workers. Workers were given rights to have a say in questions related to organizational change and the implementation of new technology[16] (Karlsson et al. 2015). Automation led to a need for increased worker competence and created divisions among workers between those who mastered the new technology and those who did not. As Karlsson et al. put it: "[..]those who used to be different had become more equal, whereas those who used to be equal had become more different [..](2015: 8)."

In the 2000s, the firm was sold to new owners and entered dire straits economically. This led to increased efforts from management to increase bureaucratic control, which was met with resistance from workers. Karlsson et al. argues that the increased level of conflict meant the worker collectivity had returned, now in a stronger form because the higher level of skills rendered some of the process operators critical for production. The company was not able to return to making a profit, and was eventually closed.

In the analysis of my data, I have not found evidence of worker collectivities (WC) in Lysgaard's sense in the two firms. When I have discussed Lysgaard and other articles using his theory, it is because it has played a part in my sociological imagination, but also because I want to use it to illustrate several points. While the WC is not an example

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[16] The Worker Protection and Working Environment Act and the General Agreement on Technological Development and Computerized Systems. Karlsson regards these as the main legacy of the industrial democracy experiments.

of a factory regime by itself, I argue that the presence of a WC in a firm suggests that the regime prescribed by the NCM is not present. In my view, the cooperational type of regime prescribed by the NCM is mutually exclusive to the WC[17], at least if we emphasize the "buffer" character of the worker collectivity, that its main function is to protect workers from the insatiable demands of the technical rational system. However, the processes enabling the emergence of the worker collectivity, such as a common understanding of problems growing from processes of identification and interaction, were observable in my data.

 Karlsson et al.'s longitudinal study of the paper mill in Moss suggests that relations in production changed from a strong WC in the 1950s to what might have been an NCM-type regime in the 1980s, and then back to a strong WC in the 2000s. However, Lysgaard's theory does not pay much attention to relations between trade union and firm. The changes in the firm between the three periods illustrate another important point, namely that the history of Norwegian working life does not develop on a straight course towards increasing regulation and harmony (Seierstad 2011).

While Lysgaard uses the concept of ideology to describe the WC system, I have chosen to use Göran Therborn's concept of ideology instead. Lysgaard does not say much about trade unions, and I did not find the WC system in my two firms. Therefore, I have opted for a wider concept of ideology that does not imply particular content (such as the WC).

Ideology

During the analysis, I came to understand the labor process as forming the terrain upon which the politics of the trade union was formulated. This started out as a vague idea, and a concept was needed to develop the analysis. Göran Therborn's conceptualization

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[17] This is in contrast to Hvid and Fuglum's reading of Lysgaard, which sees the theory of the WC as informing the basic understanding of industrial workplace relations (2019: 9). I would argue the opposite, that "industrial workplace relations" where a WC develops in response to a hierarchy tasked with satisfying the demands of the technical-rational system, is the opposite of what the NCM prescribes as success factors for Norwegian manufacturing firms.

of ideology proved to be useful in this regard, and will be introduced here (1999). The concept of ideology is the object of much scholarly debate, including scholars such as Louis Althusser, Stuart Hall, Terry Eagleton and Slavoj Zizek, to mention a few. My concern here, however, is to use ideology to gain a deeper understanding of what is going on in my data, not to re-signify my data into a theoretical narrative in which ideology plays the main role. Hence, the focus of the following is to explain how I will use the concept in this study, not to intervene in the wider debate of ideology.

Therborn's concept of ideology differs from notions of ideology as a body of thought or set of doctrines, but also from Althusser's view of ideology as false consciousness (2008). Rather, it is "that aspect of the human condition under which human beings live their lives as conscious actors in a world that makes sense to them (Therborn 1999, 2)." Ideology is part of what makes humans into conscious actors; it constitutes them as subjects. Hence, Therborn's notion of ideology encompasses both elaborate political doctrines as well as everyday practices and common sense or folk sociology. To understand something as ideology is to "focus on how a text or utterance operates in the formation and transformation of human subjectivity (Ibid., 2)."

Ideology constantly "addresses" or interpellates individuals, a process Therborn describes as *subjection-qualification*. When individuals are subjected to ideology (by accepting an ideological interpellation), two things happen. They become a subject *under* the ideology, as in a subject under the King, God or Reason. At the same time, they become *an active subject,* qualified for a particular set of roles in society. One way to exemplify this dual meaning is in a classroom, where individuals might accept the interpellation of the ideology of education, taking on the role of students; submitting to the teacher's authority, while qualifying for raising their hand to ask a question. The word *qualify* here also has a dual meaning. In the above example, students qualify for raising their hand, but also qualify the educational ideology in return, by accepting it, rejecting it, or modifying it.

An illustration of students' refusal to qualify ideology in return in the classroom can be found in Dag Solstad's *Comrade Pedersen* (*Gymnaslærer Pedersen [..]) (1982),* which was made into a film in 2006 directed by Hans Petter Moland[18]. In one scene, the pupils reject the "authoritarian structure" of the classroom and demand they sit in a circle, which is less oppressive. Pedersen, the teacher, is being torn between the ideology of education stating the authority of the teacher in the classroom, and the revolutionary ideology of the youth, with which he sympathizes. After some wavering, Pedersen hides behind his desk, reaffirming his role as the authoritative teacher, and simultaneously accepting the interpellation of the ideology of education.

Interpellation has three basic functions, all centering around making individuals recognize (a paraphrasing of Therborn 1999, 18)

> 1. What exists and what does not exist, what the world is, what nature, society, men and women are like. It makes people realize who they are and what is real and true; the visibility of the world is structured by the distribution of spotlights, shadows and darkness.
>
> 2. What is good, right, just, beautiful and its opposites, structuring people's desires.
>
> 3. What is possible and impossible, giving shape to hopes, ambitions and fears.

Ideologies are constantly addressing, or interpellating, individuals, which in turn qualify ideologies. Ideologies and interpellation are *ongoing social processes* which constantly re-constitute individuals. In the example above, Comrade Pedersen is torn between the old ideology of education and the new revolutionary ideology of the youth. The reason for Pedersen's indecisiveness might come from him agreeing with the youth on what the world is like, and perhaps also on what is good and just, but not on the last point, what is possible. The three functions of ideology thus function as a three-tiered line of defense against social transformation, or as "a logical chain of significance

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[18] A clip from classroom scene can be found here, albeit in Norwegian
https://www.youtube.com/watch?v=IlNyfkm0its&ab_channel=ChristianVassdal

(Therborn 1999, 19)." In the story of Comrade Pedersen, he finally accepts the interpellation of the revolutionary ideology, in effect stating: "that is me, this is who I am in the world!"

Therborn emphasizes that his concept is a *materialist* theory of ideology, departing both from deterministic notions of base and from superstructure, as well as avoiding an understanding in which ideology is unrelated to the material world. Instead, Therborn sees ideologies as operating in "a material matrix of affirmations and sanctions, and this matrix determines their interrelationships (Ibid., 33)." If a person who has accepted the interpellation of a particular ideology acts in accordance with what the ideology prescribes, then the outcome predicted by ideology occurs. If not, the ideology might "lose the contest" with other ideologies making sense of the world more effectively. If the subject acts against the dictates of ideology, some sanction occurs. For example, if we regard the NCM as an ideology prescribing how manufacturing should be organized, it becomes a problem if firms are successful organizing in completely different ways. When sanctions do not follow, ideology must have some defense mechanism to explain why sanctions (or affirmations) did not happen. It might be argued that the success of the firms not subscribing to the NCM is not sustainable, for example, or that the success is due to some external factor, so that the firm is successful in spite of its lack of adherence to NCM. The point is, an ideology must in some way succeed in making sense of the world. Therborn sees rituals as such a mechanism, providing symbolic affirmations or sanctions, being "particular non-discursive practices that have a meaning only within a given ideological discourse (1999, 35)".

One example from my data illustrates how ideology assists the interpretation of data: During fieldwork, I made an appointment with my contact person at Metal industries to come back and discuss my findings in a meeting. When I arrived, I found my contact person as well as a stranger in the meeting room. The stranger was introduced as the chairman of the local branch of the engineers' trade union. I had not been much in

contact with engineers during fieldwork, but my contact explained that he thought "it is important that the union is present on discussions such as these". This person was not very relevant for the following discussion, but was included in order to live up to the prescriptions of the *ideology* of NCM of cooperation between firm and trade union. This is not to say that research on the NCM *is* ideology, but it is an illustration of how understanding it *as ideology* might guide analysis. If we understand the idea of the NCM as ideology, for it to be effective, firms must in some way do what the ideology prescribes, and in turn experience what the ideology says will happen when it is adhered to, which in this case might be the combination of job quality and economic efficiency. If all firms that organized the labor process by delegating responsibility to workers went bankrupt, or outsourced production to other countries, this ideology would be less effective in making sense of Norwegian working life.

Hegemony

A concept related to ideology, at least in the tradition of Marxism inspired by Antonio Gramsci, is that of hegemony. In this investigation it will be used together with ideology to discuss aspects of the *cooperation for firm development* prescribed by the NCM. Gramsci was interested in how rulers (the bourgeoisie) got consent from their subjects to rule, and argued that coercion was not enough. A combination was necessary, and to win hegemony was "to establish moral, political and intellectual leadership in social life by diffusing one's own 'world view' throughout the fabric of society as a whole, thus equating one's own interests with the interests of society at large (Eagleton 2007, 116)."

Consent is won, then, by establishing leadership in social life, a leadership that rests on a commonality of interest. Note that this is more than a perception of shared interest; it is the *formulation* of common interest that accompanies the diffusion of one's own worldview throughout society. In line with Therborn's concept of ideology, interest is understood here is something formulated through ideology, not as something that can be read off from actors' position in a class structure. Instead, interests are very much

intertwined with questions of who we are, what we are like, what is good, what is just and the question of what is possible. Hence, interests are formulated by social actors, not "given in the reality of existence and accessible only through true knowledge [..] (Therborn 1999, 5).

It is because ideology is central in the formulation of interests that it is central to the formation of hegemony. In the words of Gramsci, it brings about "not only a unison of economic and political aims, but also intellectual and moral unity (Gramsci, in Forgacs 2000: 205)." Luciano Gruppi sees ideology as central to any hegemony and defines it this way: "The ability to unify and maintain united a social whole via ideology that is not homogenous, but is characterized by deep class contradictions (1972: 84, as quoted in Eagleton 2007)." This unification of forces cannot be reduced to an instrumental alliance, a quid pro quo where two collective actors decide that they are better off joining forces. Instead, two entities are made into a new, emergent entity. As Chantal Mouffe puts it in her reading of Gramsci: "[..] hegemony involves the creation of a higher synthesis, so that all elements fuse in a 'collective will' which becomes the new protagonist of political action which will function as the protagonist of political action during that hegemony's entire duration (Mouffe 1979, 184)." Hegemony, then, is about the formation of a new political subject, and the cement holding it together is ideology (Ibid.) While these authors' discussions of hegemony were aimed at understanding and explaining political processes in or of the state, I will use them (inspired by Burawoy's turn to the political) to understand what goes on in Norwegian manufacturing firms.

Compromise and Cooperation

My discussion of *cooperation for firm development* and the NCM will not rely solely on the concepts of ideology and hegemony, but will also draw on other concepts used to describe cooperation between trade unions and firms. To allow for description of nuances and precision in the discussion, several concepts are used in analysis. Michael Burawoy argues that globalization and increased mobility for capital forces workers to

align their interest with that of capital (1985). If capitalists can get higher profits elsewhere, they will move production abroad. Therefore, the authority of the foreman in the labor process is no longer needed to ensure conversion. Workers, in order to keep their jobs, need to cooperate with capital in order to ensure continued profits. Burawoy sees this as new type of production regime in what he calls "advanced capitalism", *hegemonic despotism* (Ibid.).

In a discussion on industrial relations in Europe, Wolfgang Streeck touches on some of the same points as Burawoy, arguing that "Given capital's new exit options, national industrial relations in all European countries seem to be becoming more voluntaristic and less obligational (1998: 15)." In addition, firms employ the organizational resources of labor in achieving increased levels of cooperation in the labor process. Central in the new order of European industrial relations, according to Streeck, is a sharing of economic risk between labor and capital, and a common search for win-win strategies in competitive markets (1998, 15). In a discussion on German work councils, Streeck describes the cooperation between workers and capital as integration of labor and capital, rather than "cooptation" (1992, as quoted in Olin Wright 2015). It is not only a matter of labor internalizing the interests of capital; capital also internalizes some of the interests of labor, with the result being an "integrated, internally differentiated system of industrial government" which "supersedes the traditional pluralist-adversarial system of industrial relations (Ibid.: 199)." While Streeck might be more skeptical of such cooperation today (See for example Streeck 2016), I have used his writing on cooperation here, in particular his notion of integrated industrial governance, because it is useful to describe my data.

I will also use concepts from Erik Olin Wright's *Understanding Class* (2015). While Olin Wright discusses ways to make models for quantitative analysis of class compromise, his concepts of positive and negative class compromise have proven useful for my analysis. Olin Wright uses the metaphor of a stalemate between two exhausted armies on a battlefield to describe *negative class compromise*. The relation between workers

and capitalist understood as a zero-sum game in which a gain for one side is a loss for the other. The opposite is a positive class compromise in which mutual cooperation between labor and capital potentially yields benefits for both greater than what they could achieve without cooperation. This is because positive class compromises allow advanced cooperation based on high levels of trust. Skill upgrades and job training become possible when workers stay in the firm for long periods. Making production more efficient becomes easier because workers are accepting technological change. This is, of course, very much aligned with the contents of the NCM. Olin Wright uses the concept of *associational power* when discussing the conditions for class compromise; the strength that follows from the collective organizing of workers. The other condition for positive class compromise is that it in the "material[19]" interests of capital; that is solves some problem for capital. As the preceding discussion on ideology and hegemony emphasized, however, the benefits of cooperation are not given by social structure, but must be created on landscapes of meaning.

Knowledge and Employee-driven Innovation

Knowledge matters in the labor process, but how it matters is a question of considerable debate. For the purposes of this dissertation, I have found the concepts developed by Lundvall and Johnson to be useful, allowing differentiating between different forms of knowledge (1994). This is useful for answering the research question because the mobilization of employee knowledge for development of the firm is argued to be an important advantage of the NCM (See for example Levin et al. 2012). Lundvall makes a distinction between knowledge and information, where the latter is that which can be codified and transmitted by bits over the Internet. Knowledge, on the other hand, is much broader, and involves skills and competencies as well. Lundvall divides knowledge into four forms: *know-what*, *know-why*, *know-how* and *know-who*.

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[19] The concept of a "material" interest is naturally useful for Olin Wright's quantitative modelling, but as discussed earlier, in the metatheoretical perspective used here, a concept of "material interest" does not make sense. That, however, does not mean that Olin Wright's concept cannot be put to use as metaphors to help see things in my qualitative data.

The first covers facts and information, while the second one concerns scientific laws and principles – in other words, knowledge that is codifiable and easily transmittable through text (or other media). Know-how and know-who cover the more tacit aspects of knowledge, such as skills and competencies (know-how) as well as the knowledge of who knows what. These two are to a large degree firm-specific and not as easily transmitted. The delegation of responsibility to workers for problem-solving is one way of mobilizing such knowledge. The continuous improvement prescribed by Lean is another example of how such knowledge might be harnessed for increased efficiency.

The concept of employee-driven innovation (EDI) is used to describe instances where the knowledge of ordinary employees (not tasked with innovation) is used as a source of innovation. In his introduction to an anthology on EDI, Steen Høyrup discusses several definitions of innovation, before formulating his own:

> Employee-driven innovation refers to the generation and implementation of new ideas, products, and processes – including the everyday remaking of jobs and organizational practices – originating from interaction of employees, who are not assigned to this task. The processes are unfolded in an organization and may be integrated in cooperative and managerial efforts of the organization. Employees are active and may initiate, support or even drive/lead the processes (Høyrup et al. 2014, 8).

Høyrup qualifies his definition further by describing three types, or "tiers", of EDI. The first is when the initiative comes solely from employees, when the process is entirely bottom-up. The second tier is when management tries to formalize the processes leading to the first type, for example, by leaving employees time to come up with suggestions on their own accord. The third tier is when employees are invited by management to participate in the innovation process. I will use the concept of EDI to describe types of *knowledge mobilization* from employees that are locally understood as *continuous improvement*. These will be described in chapter six, and I understand them as examples of EDI in Høyrup's sense. While others, such as Kesting would

disagree to such as conflation between Lean and EDI, I find it to be justified for my purposes here (see Kesting and Ulhøi 2010).

Financialization

Finance concerns the management of money. The concept of financialization will be used in this study to imply that the owners of a firm are engaged in accumulation on financial markets. That is, that the main form through which the firm accumulates capital is by the buying and selling of assets, rather than producing commodities or services. Private equity firms are financial actors that look to raise capital in order to acquire other companies (Applebaum et al. 2013). Private equity firms typically look to own the companies for the short term, developing the companies in order to sell them for a higher price to another type of owner. Such development can take the form of restructuring or selling off assets. In a study of private equity firms, Applebaum et al. found that one way private equity funds create financial value is by the breaching of trust and rescinding informal contracts in firms (2013). This way of creating financial value might potentially represent a threat to the NCM, which is dependent on trust and informal understandings between workers and management.

Migrant Labor

Another possible challenge to the NCM is the sharp increase in staffing agencies (Rasmussen and Mjønes, in Bungum, Forseth and Kvande (eds) 2015). In 2004[20] and 2007[21], the EU was extended eastwards, enlarging the labor market for Norwegian firms considerably. The combination of high demand for labor in Norway and recession in parts of Europe led to considerable labor migration from Eastern Europe to Norway (Friberg 2016). This led to a large increase in the number of staffing agencies (Alsos and Jensen 2013). One consequence of this is that firms organize work in such a way that the continuous use of migrant labor becomes possible (Eldring, in Bungum, Forseth and Kvande (eds) 2015). Temporary labor and migrant workers were part of the labor

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[20] The Baltic countries, Poland, Slovakia, Slovenia, Czech Republic and Hungary joined the EU in 2004.
[21] Bulgaria and Romania joined in 2007.

process at Safe Manufacturing. While this study is not *primarily* interested in labor migration, it plays a role as a reality on the shop floor and an aspect of the factory regime at Safe. I will use Vidal and Tigges's (2013) concept of *systematic numerical flexibility* in my discussion of the role of temporary workers at Safe. Based on data from Wisconsin, Vidal and Tigges describe three ways firms employ temporary employment to achieve flexibility: reactive use, when firms increase the number of workers due to some unforeseen event; planned use, when firms increase the number of workers to help with expected increased in labor need; and lastly, systematic numerical flexibility, when firms come to rely on temporary labor for core tasks.

In discussing migrant labor at Safe I will also draw on Dawson et al.'s (2018) research into the perception of a *migrant work ethic*. Starting from perceptions of managers in the UK on the strong work ethic of immigrant workers, Dawson et al. found that such workers had substantially lower rates of absence from work than British workers. After a few years of working in the UK, migrant workers rates of absence would conform to the average of native workers. Dawson et al. argue that this difference should be understood not by the superior work morale of migrants but by their relatively low power in the labor market compared to British workers. Their lower levels of command of English played an important part in this. The link found by Dawson et al. between perceptions of work ethic and workers' power in the labor market will be used in interpretation of the perceived industriousness of migrant workers at Safe Manufacturing.

In my analysis of migrant workers, I will also use the concept *social reproduction.* A concise description of the focus of social reproduction theory is given by Tithi Bhattacharya: "What kinds of processes enable the worker to arrive at the doors of her place of work every day so that she can produce the wealth of society (2017: 1)?" In a chapter of the book from the introduction of which this quote is taken, Nancy Fraser argues that our understanding of capitalism should not be limited to the economic system. It is necessary to also take into account the "non-economic" background on

which the official economy depends (Fraser in Bhattacharya 2017 (ed), 23). While this sphere is not the object of inquiry in this study, Fraser's highlighting of the importance of the "non-economic" background helped me pose new questions of my data and deepen the understanding of what migrant workers meant for Safe Manufacturing (see chapter six).

Categorizing Firms and People

When describing Safe Manufacturing I found Joan Woodward's (1965) description of *small and unit batch production* useful. Such firms are characterized by production being based on orders so "that in theory, they had no future beyond the period covered by their order books, so that all their financial planning was short term (Ibid., 129)." Furthermore, such production is often labor-intensive and requires skill and experience. A central feature of such production is that marketing is the first part of the production cycle. It is here that the idea of a product is sold to a customer, then it falls to engineers and workers at the firm to come up with a product satisfying the expectations of the customer. Hence, products are often unique and have to be custom-made for each individual customer. The relationship between the firm and the customer is often a continuous one, and might include troubleshooting, installation, and so forth. Woodward and her colleagues found that in such firms, the drawing office (where blueprints are made) often had a high status, and that "when production ran into difficulties the development engineers quickly became involved (Ibid., 131)."

When describing different positions in the organizational hierarchies of the firms, I will draw on tried and tested concepts such as worker, operator, manager and executive. For the workers in production, I will use the concepts used in the firms. At Metal, shop-floor workers go by operator, while at Safe they were workers. Hence, the use of worker and operator and their use in the dissertation carries no theoretical implications, but are derived from the data. I have chosen to translate the Norwegian *bas,* used to designate workers with increased responsibility for overseeing production, into *leading worker.* I have used *manager* to designate people who have some form of

formal authority over workers, with *executive* being used for the top level of the organization. When describing workers in their capacity as trade union members, I have called them *trade unionist* or *trade union activist* when s/he is a worker active in the union, *shop steward* if he or she has some position in the union, or *trade union leader* if I am talking about the leader of the union at the firm. For readability, I have used name (pseudonym) and title when quoting people or describing observations of people.

Conclusion

This chapter has completed the process of encasing by combining my reading of Michael Burawoy's work with my reading of literature on the NCM. Focusing on what Falkum (1998) calls the "cooperative tradition", I have shown how both delegation of authority in the labor process and cooperation for firm development are central to the production regime prescribed by this literature. The NCM therefore becomes an answer to the imperative to accumulate capital from within the Norwegian institutional context. I have explicated the metatheoretical reflections upon which my research object rests, arguing that coherence is to be sought in my analysis of the meaning in the case, rather than adopting a ready-made theoretical framework. Instead, I have opted to construct my own conceptual apparatus according to what was necessary to interpret the data, and put them in a dialogue with the research object. Hence, this conceptual apparatus has been tailored specifically to my research question and allowed me to craft the narratives from Safe and Metal. The encasing and construction of the conceptual apparatus is what allows me to answer the research question of why regimes differ, because it enables an investigation of why some firms adhere to the "script" of the NCM and other do not. This is also where the main contribution of this dissertation lies, not in describing what is typical (the NCM), but in exploring why some firms are typical and others are not, locating the answer in particular contexts of meaning in the firms.

Chapter 3: Methods

This chapter will build on the discussion in the preceding chapter to discuss the process of data generation. Taking inspiration from Burawoy's notion of a reflexive science (1998), a large part of the chapter is devoted to reflecting on my experiences from fieldwork. Rather than simply going out to "the field" to gather data, fieldwork turned out to be an intense process of continuous decision-making for which no answers were given in advance. I will start by linking my methods of data generation to the theoretical development of the research question that took place in the previous chapter. From there I will go on to discuss some of the complexities that arose during fieldwork, such as negotiation of access, establishing relations with informants, and differences between the participant observation in the two firms. Ethnography denotes both a way of generating data – participant observation – and a form of exposition – narrative (Rhodes 2017). I will also discuss the analytical process, and how the narratives from the two sites were developed in a continuous dialogue with each other and theory. Together, these reflections will set the stage for the four analytical chapters to follow.

Ethnography

With the development of the research questions from the previous chapter in mind, it is possible to restate the research strategy in a concise way here. I will investigate production regimes and their reproduction in the Norwegian institutional context. Reproduction of social relations is a question of both internal and external relations. It is a question of both the context the firm finds itself in, as well as what goes on in the firm. It is the latter that will be the primary focus of this study, emphasizing what Burawoy calls the *subjective* side of production, the social relations actors are part of, and their experience (interpretation) of those relations. Hence, meaning and interpretation is the central object and task of analysis.

As a consequence of this, participant observation was chosen as the primary way of generating data, supplied by interviews. The project is an ethnographic one, leaning on the understanding of ethnography provided by Emerson et al. (2011): a combination

of immersion into an unfamiliar social world through participant observation, as well as the writing of a narrative of this world based on such participation. Participant observation, as Emerson points out, cannot be done by the fieldwork trying to be neutral or a "fly on the wall (Emerson et al. 2011, 4)." It follows from this that doing participant observation is a series of unfamiliar situations which the researcher has to navigate without having some guide to what is the "best" course of action in any given situation. A large part of this chapter will therefore be reflections on my attempts to navigate the messy waters of participant observation at the two sites.

It is not possible to step out of the social reality of which the researcher is a part. There is no *God's eye point of view*, seeing everything from nowhere (Haraway 1988). What can be done, however, is to thematize the role of the researcher in knowledge construction. Michael Burawoy (1998) emphasizes that data is not waiting "in the field" to be discovered. Rather, data is produced by the researcher in dialogue with the subjects of research. In this dialogue, however, the initiative lies with the researcher, as it is the researcher that has the privilege of formulating and asking the questions (Bourdieu et al. 1991). The majority of this dialogue (the majority of the data production) has taken place on the shop floor in dialogues between the people who work there and the researcher. Thus, the ethnographic perspective developed in this dissertation is one situated on the shop floor, at the point of production. In answering the research questions, however, it has also been necessary to go to offices of managers and trade union representatives.

Selecting Sites for Investigation

There were several criteria for the selection of the original sites to do participant observation. As discussed in the introduction, as the research project progressed the initial research questions were left behind and others were formulated. This does not imply that the sites chosen were less than ideal for seeking answers to my investigation. Rather, it implies that the questions I had initially formulated were not the most interesting questions to pose concerning what went on at the sites. For transparency I

will briefly present the original selection criteria that led me to Safe Manufacturing and Metal Industries, which in turn led me to reformulate my project.

The first criterion was competitiveness on the global market. Safe Manufacturing was a successful firm in its niche for offshore safety products. Metal Industries likewise competed on a global market, selling their aluminum on the London Metal Exchange. Thus, they faced the full competitive pressures of global capitalism. The second criterion was for the firms to be located in Norway, but outside of the largest agglomerations or clusters of industrial firms. The idea was that this would make it easier to understand how the NCM contributed to their competitive strength, as the picture would not be disturbed by possible advantages coming from their integration in a network of other firms. The third criterion was that management had made decisions on localization to stay competitive. Safe Manufacturing considered moving production but decided to stay for fear of losing local know-how (fieldwork would later nuance this). Metal Industries was chosen to be the pilot plant for testing out industry 4.0 in the Metal concern, thus showing how the multinational firm decided to commit even more to the smelter. Hence, firm decision-makers seemed to have reflected upon the particular advantages of staying in Norway, making the firms ideal for a study of a Norwegian production regime.

How Data was Generated

The data used to answer the research question was generated over six weeks of fieldwork, resulting in approximately 300 pages of transcribed fieldnotes. An average day would typically amount to 10 pages after transcribing the shorthand jotted down in the field diary. While the fieldnotes comprised the main part of data, I also conducted 33 interviews – 22 at Metal and 11 at Safe. I was also provided with presentations from the firms in the form of PowerPoints. As preparation for fieldwork, I acquainted myself with the firms by using searching for older news articles about them in the media archive service A-tekst, as well as firm presentations from their homepages.

Fieldwork

The fieldwork was divided into three intervals, with the two first taking place with two different teams at Metal Industries. For two weeks I accompanied one team in the Casting Hall, before I spent two weeks at the Anode Bakery. There was two-month period in between, which was used to go over data and reflect on the first fieldwork experience. Because of this, my entry to the field the second time around was much smoother than the first. The key to this was making contact with the closest superior of the team, the team leader, as well as the team's trade union representative, before entering. The first time around I only planned my stay with managers on the executive level and the trade union leader, believing that necessary arrangements would be made by them with the team in question. This would not be the case, and when I arrived at Metal for the first time I learned that the team and managers at shop-floor level had only been notified a few hours before my arrival. This experience also informed my negotiation of entrance at Safe Manufacturing, making sure to establish some contacts in production before going in.

During my fieldwork at Metal, I followed the same schedule as the teams, participating in day, afternoon, and night shifts. A day shift at Metal runs from 0645 to 1500, with overlaps between the shifts at both beginning and end. The afternoon shift is from 1445 to 2300, with night shifts during weekdays from 2245 to 0700. During overlaps, team members gather in rooms that serve as both control rooms and places to gather between tasks. Hence, these rooms are where a lot of interesting conversation, gossip and banter (both for the researcher and the team members) takes place. During weekends, teams work 12 hours per shift, starting Friday at 1900, and then overlapping with the day shift at 0700 the following day. Thus, there are only two shifts per 24 hours on weekends. Before the start of fieldwork proper at Metal, I participated in their internal course in *Lean Manufacturing*, which was mandatory for all operators. I also went to Lillevik to agree on the specificities of my stay at Metal.

Fieldwork at Safe Manufacturing was done over the course of two weeks, with two visits to the premises before the start of fieldwork: one to agree on the practicalities with a senior executive, and one to meet up with the trade union to discuss my stay on the shop floor. I divided my time at Safe between the two main production halls, Fabrication and Final Assembly, with one week of observation in each. As Safe was a smaller place than Metal, it was much easier to go back and forth between Fabrication and Final Assembly, and there was also more interaction across the different production halls than was the case between the Anode Bakery and Casting Hall at Metal. At Safe, production is not around the clock, so the working day for the majority of workers at Safe starts at 0700 and ends at 1500. However, overtime was quite frequent. In addition, a group of migrant workers worked longer hours in order to save up time to go home for extended periods.

In classic anthropology, fieldwork might last a year or even more. My fieldwork lasted approximately two months when accounting for additional trips as well. A seasoned anthropologist might object that this is not enough to get properly *immersed* in the field. Having the advantage of doing fieldwork both in a culture with which I was relatively familiar and in a language of which I was a native speaker did shorten the time needed to get acquainted with the fieldwork setting (Bernard 2006). For several reasons, I conducted a longer period of fieldwork at Metal than at Safe. As Metal was a much bigger firm than Safe, I conducted fieldwork at two separate places to be able to compare the shifts and have the culture of the organization as my object. Limiting my stay to one shift only would have run the risk of observing relations and practices particular to one shift only. After fieldwork on two shifts, it became possible to see what was common between them. In addition, after fieldwork at Metal, I expected to encounter more of the same at Safe: an organization of work adhering to the core tenets of the NCM.

As discussed in the introductory chapter, this was not the case – I encountered a different type of factory regime. At Safe I also found that the workers were divided into

two groups, one group of Norwegian workers and one group of migrant workers. The latter group did not speak Norwegian, and their proficiency in English varied. This limited access to this group, but, as I will discuss in a moment, there were also other reasons for this lack of access. Still, I would argue that the most important factor is not the length of fieldwork per se, but the data one generates and the conclusions one draws from it. Hence, ethnography should not be judged by the length of fieldwork, but by the way interpretations are grounded in data. So, rather than being concerned with the length of fieldwork, I have been concerned with not drawing wider conclusions than my data allows for. An advantage of re-encasing the research object after data generation is that the questions can be adjusted to the data. The alternative to reformulating the research questions and analytical questions would have been to adjust the data generation process by extending the fieldwork. When I chose to reformulate the research questions, it was because I saw that the data I did generate at Safe and Metal could answer questions I deemed more interesting than my initial questions.

The more personal experience one shares with informants, the more one has to draw on when establishing relations (Bernard 2006). This was noticeable during the fieldwork, where it was easier to connect with workers closer to my own age who might have many of the same cultural references, and often were also parents, which was a comfortable topic to draw on during breaks where nothing was happening. Thus, the phase of "learning enough to be able to learn" (Bernard 2006, 551) was considerably shortened, and for the most part I could start learning as soon as I entered the field.

Intuition and Access

Follow your nose wherever it might lead you. (Gluckmann, quoted in Handelman 2005, 1)

No matter how well planned the fieldwork was, during every day in the field a host of decisions had to be made on the spot. Should I follow Ole, Odd and Oliver to lunch, or should I stay here with Oda and Michael to see if they can get the forklift working?

Should I take up the manager on his offer of lunch, or will that make me seem like an ally of management? Should I explain that I have no idea what they are talking about, or should I just follow the conversation and see where it goes? These kinds of decisions had to be made on the spot every day and were impossible to plan for. Thus, I very much had to abide the advice of Gluckmann and follow my nose. I had to pursue everything that seemed interesting in that it broke with expectations or seemed like anomalies to some pre-understanding (for a phenomenology of the interesting, see Davis 1971). Pre-understandings are influenced by theory to various degrees, so what is interesting to the nose is somewhat shaped by theory. Over the course of fieldwork I would identify certain "scents" as more interesting than others, but I usually tried to follow up on everything that might have something to do with knowledge, organization or industrial relations. This was based on a hunch that these themes would prove interesting in one way or another. As mentioned in the *biography of the research question,* my interests changed over time, and many of the trails I meticulously followed never made their way into this dissertation. However, the wishes of the participant observer are not the only factor deciding what data can be generated and with whom.

Take what you can get. (Rhodes 2017, 80)

In general, sites of industrial production are not places where one can go where one pleases. They are (in my experience) highly regulated places where safety rules govern where one can go and not. For much of the time, and especially in the beginning of fieldwork at new sites, I was dependent on people following me around both because I did not know my way and because it was not safe to have me wandering about unsupervised. This limited where I could go, but, as workers had to accompany me, it also brought me into a lot of social interaction. This was a welcome opportunity to talk directly with workers one at a time, giving me more leeway to steer the conversation than I had when several workers were present. This allowed for more follow-up questions, as well as broadening the range of topic that informants felt comfortable

talking about. During my fieldwork at Metal Industries, access was not much of an issue and I could go where I wanted to, as long as I could find a socially acceptable way of getting someone to show me the way there. This was not usually a problem, as I followed smaller groups of workers around for each shift. At Safe Manufacturing however, there was a part of production I was not able to negotiate entrance to, namely the section run by migrant workers.

At Safe Manufacturing, I spent one week of fieldwork in Fabrication and another in Final Assembly. In the latter, there was a combined office and break room where people came and went, which was a good base for me as I could engage naturally in conversations with people coming and going as well as take trips out into the production hall to talk with people there. Since engaging people in conversation when they were busy performing a task was not ideal, a large part of my fieldwork was spent in the office talking with people between tasks.

In Fabrication, however, there was no such break room, and I was given an office next to the foreman to stay in when I was not doing anything in particular. With two exceptions[22], Fabrication was run by migrant workers with no knowledge of Norwegian and varying levels of proficiency in English. During fieldwork, I thought this was the main reason for my lack of access to this group. After going over fieldnotes, however, I realized that there was also a reluctance on the part of management to put me in contact with the migrant workers.

> Field diary: Mathias the foreman tells me that the [migrant workers] is a closely knit group that likes to work, as an explanation as to why it will be difficult to get much interaction with them. In Final Assembly it will be easier, he says, as there is more downtime and they speak Norwegian.

> Field diary: Is there a break room where I might hang out? No, [migrant workers] only have scheduled breaks at certain times, and when not, they are working continuously. So interaction will be hard, Mathias explains.

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[22] There was one Norwegian worker and one Norwegian apprentice.

Field diary: I sense that Mathias doesn't know what to do with me. I suggest the [name of other section], and he makes the call to check if I can come over. "No, no, he won't be in the way", I overhear.

These examples illustrate how access to immigrant workers was hard to obtain. There might be several reasons for this. The company might have thought it was better if I did not speak to the migrants because there was something there not fit for outsiders' eyes. Or there might be worries that I would interrupt the work flow, as the last example shows, as Mathias tries to convince the manager that I will not be in the way. Or perhaps Mathias thought they would react negatively to my presence. It might be that the error was on my part, not being insistent enough on interacting with the migrant workers, or not being vocal enough about my needs. My lack of access to migrant workers became clearer to me upon analyzing the data, but during fieldwork at Safe I also had a sense that I should try to make interaction with migrant workers happen in some way. My attempts, however, did not succeed. Fieldwork is a continuous balancing act between seeing what is interesting and not causing too much trouble for the firm who had granted me access to do my research. With this in mind, I tried to *follow my nose where it led me*, while at the same time being content with *what I could get*.

Could I have gotten more if I had spent more time at Safe than my planned two weeks? This would undoubtedly have resulted in more fieldnotes. It is unlikely, however, that another week or two would have made the migrant workers more accessible, as my lack of contact was both a question of me not speaking their language and the hesitancy on the part of management to let me interact with them (see also "Differences between Safe and Metal" for other points relevant to this).

A Fieldworker and His Field

Fieldwork entails taking on different roles related to what one is doing, whether it is conversing, observing, or participating in some task (Wadel 2014). During my fieldwork, participation was rarely feasible as most of the tasks required extensive skill or

knowledge of procedures. While I did get to participate some of the time, it was clear that this was just slowing the general flow of work down and was merely being done as a favor to me. Thus, I usually fell into the role of the researcher asking questions about everything; or, rather, the role of an apprentice, which was a common sight on the shop floor – much more so than a researcher. This proved quite useful as people often took care to explain to me what was happening. Asking what people were doing was an excellent way of establishing a rapport and was often a springboard to talking about other issues, such as knowledge, organization of work, and industrial relations. Having a basic grasp of tasks and work processes was also a prerequisite for understanding how they were connected to the issues I was interested in. However, falling into the role of the apprentice did not mean that interaction always flowed smoothly.

Early in the first part of fieldwork, I learned that interacting with managers and interacting with workers were two quite different things. While managers were often talkative and easy to engage in conversation, workers could at times be less forthcoming. Because of this, I often felt uncomfortable during fieldwork. The world of industry was a different world than the one I was used to. There were a host of social rules and cues I was not aware of, in addition to complicated rules for safety, including where one could go and not go. Having constantly to ask what I knew to be dumb questions to people busy doing some job brought with it a feeling of discomfort. At the beginning of fieldwork at Metal Industries, I also felt as though relations between myself and the team were rather strained. People were not unfriendly, but I sensed some anxiousness from some of the workers related to my presence. I was often asked what I was writing in my book, and perhaps some wondered exactly what my relation to management was, even though I made an effort to explain how this project was my own, and not related in any way to the goals of management.

A few days into fieldwork, I managed to alleviate some of this tension by making a successful joke. I had left early from the evening shift the day before. The next day I

came for the evening shift, and sat quietly during overlap where the two teams would discuss practical matters of work as well as joke around. At a moment where everyone was quiet, I asked my team whether they had managed yesterday even though I left a few hours early, implying that I was actually an important person that the team depended on. This was met with laughter all around and comments of "only barely". After this, I felt more comfortable in my role as the unknowledgeable guy. At the same time, the team seemed to be more accepting of my presence. At the time, I was just happy with feeling more at ease on the team. After returning from the field, and reflecting on it over fieldnotes, however, I came to understand this episode as important in establishing my role as an apprentice on the team.

By making an ironic comment regarding my importance to team success, I underlined my own position as an outsider. I showed that I was aware that they were the experts, and that I did not see myself as an expert of any kind with regards to the shop floor, or innovation for that matter. By making the joke in front of everyone, a sort of common understanding of my role was established, and it was understood that I was not out to challenge their knowledge superiority or their ways of doing things in any way. One way this might have changed data generation is by making both informants and researcher more at ease, making conversation flow easier, allowing for dialogue on a greater variety of themes.

While my status on the shop floor was that of an outsider, I felt more at ease when talking with managers in offices. This was closer to my own world, where language was the most important tool, and perhaps my position as a PhD candidate also carried some weight. There was no need to clarify my position by joking with the managers – my position was clear: I had come from the university to do research on the firm and what was going on there. Some of the managers might also have seen me as, if not an expert, knowledgeable of relevant issues, as my research was related to innovation and the NCM.

One way to understand this is as movement. When talking with managers, I moved from my own world of social theory, research, offices and meetings to the manager world in the firms, which also consisted of offices and meetings. The other move was from my own world to the world of the shop floor, with physical work, skill, welding, liquid metal, and so forth. During fieldwork, I experienced how the former move took place over a shorter distance than the latter. While it was certainly more comfortable to be in the "manager world", than the shop floor world, I came to think of the data from the shop floor as somehow containing more interesting information. This fits well with the insights offered by Cato Wadel (2014): the more foreign is the culture one is observing, the easier it is to observe and question things that otherwise might have been taken for granted. In this sense, the world of the shop floor was far more foreign to me than the world of management. While I was, as mentioned earlier, doing fieldwork in my own culture, with many shared cultural categories, I was at the same time in a different part of my own culture. The above shows how different parts of one's own culture can be quite foreign indeed, and thus make it easier to see certain things (Wadel 2014, 27).

Awareness of this made it possible to consciously devise steps to counteract it, resisting the urge to take the comfortable road and spend time with managers and instead forcing myself to remain with the workers, even though I often felt both out of place and in the way. Such considerations were the reason I was present when the episode described under the heading *Resistance* in chapter five occurred, when operators rallied against the team leader. Five minutes earlier I was sitting in the lunchroom, but suddenly realized all the operators had left and only the staff and managers were eating. Upon realizing this I quickly finished my lunch and went to the control room to sit down with the operators, who were discussing how managers would have lunch beyond the scheduled time. The conversation that followed between the operators became an important piece of data from Metal. This does not imply that I was accepted as a fully integrated team member at all times. At other times, I would find myself alone in the control room while operators gathered in some neighboring office to have some

private conversation. But for the most part, my presence was accepted, and I was not, in my impression, seen as an ally of or closely connected to management.

Differences Between Safe Manufacturing and Metal Industries

At Metal Industries the autonomous team were given the responsibility of "entertaining" me during fieldwork. This proved fruitful as I was constantly invited to follow operators on their tasks and they took various initiatives to show me things that they deemed important to understand what was going on. This included taking me on tours to different parts of the smelter, where I initially had no plans of going. Operators would do this between tasks instead of taking a break. They would also plan for where it was good for me to be in the coming days. This had the advantage that I "got stuck" with smaller groups of operators for an entire shift, with the consequence that I could interact with or observe operators all the time.

At Safe Manufacturing, observation worked in a different way. For the most part I had to engage people in conversation, and ask to go places, on my own initiative. When asking workers to come and observe their work, this often had to be checked with management. My understanding is that this was not an example of the people at Safe being less friendly as individuals than at Metal, but as a consequence of how the labor process was organized. The autonomous teams at Metal had greater scope for discretionary problem-solving and were expected to solve problems on their own initiative. The workers at Safe, on the other hand, did what management instructed them to do and constantly needed to check with management if there were problems. Being instantly embedded in the team at Metal made it quicker to establish a rapport, and the team saw it as their duty to make my stay a fruitful one. At Safe, though, the duty of making my stay worthwhile fell to the foreman, which resulted in the establishing of a rapport with workers taking more time.

During fieldwork at Safe, I was stressed by this because I felt I was not getting the same quality of data I had gotten at Metal. During analysis, however, I realized it was not the

data that was richer or poorer, but the interactions between workers at Safe and Metal that were different. The organization of the labor process had consequences not only for workers' experiences of work, but also for my experience of participant observation.

Field Diary: What are you Writing?

Observations during fieldwork were noted down in the field diary, with the average fieldwork day being recounted in 5000-6000 words. Sometimes, people would react to me writing in the book during their conversations, and I would explain that I would write down as much as I could, as I couldn't know now what would be important for me to understand later. This was for the most part accepted as an explanation. Still, there were times when interesting conversation was going on and I feared that picking up the book to write would interfere with what was happening. In such instances, I would try to memorize what was going on in order to write it down afterwards. This particular instance, documented in the field diary, inspired this practice:

> Oda: Oh no, now he is writing again (in a friendly way).
>
> Me: Is that bad?
>
> Oda: I don't like it when you note down all our stupid banter [*dumme skitpraten*].

When there was nothing to do, I would write notes in my field diary, recording impressions, ideas and speculations. Thus, analysis and writing started in the field (Emerson et al. 2011). After each work day I would transcribe that day's field notes into my computer, fleshing out what was put down in shorthand during the day, reflecting over episodes that seemed significant and planning for what leads to follow up the coming day. Ideally, this would be done right after work, when the impressions were still fresh in my head. After afternoon shifts (ending 23.00) or night shifts (ending 0700), this was not possible, and the writing up of field notes had to be postponed to the following day.

Interviews

In addition to fieldwork, interviewing was used to produce data. With *interviews* I mean talks with an audio recorder after making an appointment. These talks would be prepared by making an interview guide with a set of relevant questions to pose to the interviewee. Thus, every interview guide was unique. During the interview, I would usually follow the conversation where it went, and only rarely interrupt people in an effort to bring us back to topic. My idea of what was important – and thus "the topic" – became clearer and more focused as fieldwork went on.

In total I conducted 33 interviews. Twenty-two of these took place at Metal Industries; 20 took place in the same period as fieldwork, and two interviews were done after fieldwork to follow up on specific questions. At Safe Manufacturing I did 11 interviews; two were done before the start of fieldwork. In addition, I did one interview with a trade union activist from the United Federation of Trade Unions [*Fellesforbundet]* in order to understand the trade union's policy towards temporary workers. Over the course of fieldwork, I found that it was better to talk with shop-floor workers during natural stoppages in the work rather than scheduling formal interviews. Hence, over the course of fieldwork, interviews became the main way to talk to managers and executives while I used my time on the shop floor to interview workers, both formal interviews with a recorder and informal but scheduled talks.

Fieldwork and interviews complemented each other, and often I would learn about some issue during informal talks on the shop floor, then follow this up with the trade union and management, much in line with what Bernard argues regarding the interplay between unstructured interviews (conversations during observation) and structured interviews (Bernard 2006, 213). The selection of whom to interview was for the most part done during fieldwork, as I gained a better sense of who would be most useful to talk to. Some people might be difficult to get a hold of during working hours and would thus be better candidates for interviews (some of the managers), while others I had access to during observation (workers or others present in production).

While observation was the main form of data generation, the data from interviews made it possible to follow up on observations, asking people to explain some episode or get their views on a situation. Insights from interviews also made it possible to ask informed questions during field conversations. While the decision to conduct most interviews parallel with observation was taken for practical reasons, it had the consequence of interviews and observation informing each other.

Analyzing Data

While there is no hard demarcation line between generating and analyzing data, the main part of analysis was done after fieldwork. All the data was analyzed using software for qualitative research, Maxqda. Interviews were transcribed, and small notes were written when I came across something I thought would be important later. Then, field diary and interviews were coded. The coding was a mix of deductive (from theory) codes and inductive codes (from data). As coding went on, the proportion of inductive codes increased as I was becoming more familiar with the data and saw clearer which stories could be developed. As analysis progressed, the main function of coding was indexing of the data, sorting observations together in various ways to look for relations between them.

The main part of analysis, however, consisted of writing. After each fieldwork, I wrote field reports, which were discussed with my supervisor. From there I started writing narratives from the two firms in the belief that I would write four chapters total in my dissertation – two "empirical" chapters, and two "analysis" chapters. After writing, editing, re-writing and editing some more, I realized that the main analytic job was actually to choose which stories in the material to write out. Therefore, I changed my outline for the dissertation and dropped the idea of writing "empirical" chapters altogether, choosing instead to have an analytic voice throughout. I realized that analysis was integral to the crafting of narratives, which involved a host of analytic choices in what to highlight and what to leave out. The task of analysis therefore

became one of writing and re-writing, encasing and re-casing, rather than developing advanced coding schemes.

The first draft of the monograph was written for my mid-way seminar at Nord University. Here, a structure of one chapter each on Metal and Safe was attempted, with the plan to write to analytical chapters to discuss their differences. This approach was abandoned, and I started working on what ended up as the current structure, with four chapters describing Safe and Metal, before the concluding discussion. For my final seminar, a new draft was presented containing all chapters minus the conclusion. After this there followed another re-write, including the writing of the discussion and conclusion, which prompted a new round of rewriting. The starting point of this process of writing was the analytical chapters, assembling observations into narratives, then looking for theoretical concepts to help me highlight different aspects of what was going on. In the words of Reed (2011), observations were connected to theory in order to make maximal interpretations.

There was a marked difference between analyzing ethnographic and interview-generated data. In analyzing the former, I could draw on my experience from being in the situation, observing body language, tone and all the myriad sensory cues to interpret what was being said or happening. Interview data, on the other hand, required more work to see which parts fit together. I therefore developed most of the storylines in this dissertation from the observational data. These were then complemented with data from interviews. As mentioned previously, the interviews were for the most part planned based on the knowledge needs I gained from observation. Thus, the analytic phase followed the same chronology as the data-generating phase, starting from observation and from there going on to interviews. The comparing of the narratives was a back-and-forth process both between the two narratives and between data and theory. The heuristic device that was developed in the theory chapter was the outcome of this process, not its starting point.

This dissertation was written by developing what Emerson et al. (2011) calls a thematic narrative. In accordance with Emerson's advice, the idea has been to let the data tell the story rather than writing an analytic story where quotes or observational data are used as examples. While no analysis is free of theory or pre-understandings, I have strived to let the data "speak", then looked for appropriate theoretical concepts, then gone back to data to see it in new ways, then back to theory, and so forth, in what Cato Wadel (2014) calls the dance between theory and data. Thus, the fact that the narrative is thematic points both to the relation between analysis and presentation, or form and content.

Observation and interviews yield different types of data. Social interaction has a symbolic side to it. We often do things differently when we are observed. For data gathered during observation, however, the main audience was fellow workers, belonging to the same webs of significance as the person saying something or performing some action. In the interview setting, the main audience is the researcher and the interviewee is reflecting on her own actions is retrospect. During observation, one can in principle observe webs of significance in action, with one less layer of interpretation than the interview. In the interview, the researcher must interpret the interviewee's interpretation of the incident in question. During observation, it is the researcher's interpretation of an unfolding incident.

Ethics

The project was submitted to the Norwegian Social Science Data Services (NSD[23]) and approved prior to data collection. In addition, non-disclosure agreements were signed between the researcher and the firms. In order to maintain the anonymity of informants and the firms, they have been given pseudonyms. For clarity, I have tried to stick to a system where operators start with an "O", managers with an "M" and

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[23] Project number at NSD 61282.

engineers with an "E". Some of the specific details of production, as well as historical events, have purposely been made vague.

At the start of fieldwork, information about the project was given at meetings with employees, as well as posted on boards in relevant locations. Those being observed were informed that it was voluntary and that it was possible to be exempted from observation, not in the sense that I would be able to unsee what I saw, but in that I would not note down things. No employees asked to be exempted from observation. However, as mentioned earlier, I sometimes experienced that informants would go somewhere else to talk when I was present. At the beginning of every interview, a form with information about the rights of the interviewee was handed over and explained, with information on how to contact me, my supervisor and NSD. I kept a copy signed by the interviewee. Out of 33 interviewees, one said no to being recorded. During another interview I was asked to turn off the recorder for the remainder of the interview.

In order to anonymize both the firms and my informants, I have at times been deliberately vague on certain details, such as the time of a major event in the company's history. Some dates have also been changed when it does not matter for the argument being made. This is also the case when it comes to positions in the firms that are unique, such as CEO. I have instead used senior executives to designate the top leadership in the firms. The upside of this is increased anonymization; the downside is that some of the "flavor" has been lost.

The practice of anonymization was done out of ethical considerations, but it also had consequences for data generation. On one occasion, I experienced how demonstrating how anonymization worked in practice led one informant to open up about topics he regarded as sensitive. The context for this excerpt from the field diary is me following up on some topic with Odin, while Oddvar is also present.

Oddvar: Who told you that?

Me: Erm, I do not remember exactly….Still, if I did, I would not divulge it, as I promise everyone anonymity, I cannot say who has said what.

Oddvar: Aha, well, I was just curious.

Later in conversation:

Odin: Well, since you said you would not divulge who has said what, I will tell you that [..].

This episode shows how the concrete example of how anonymization works encourages Odin to divulge information he would not normally feel comfortable divulging. It illustrates how much greater an impression an example of anonymization gives than explaining it at a meeting or posting the information on a board.

Concluding Remarks

By starting from the discussion of theory and the research question in the previous chapter, in this chapter I have discussed the methods of data generation: participant observation and interviews. I have discussed some of the challenges and decisions that were made, and their consequences for data generation. I have explained some of the differences between the two sites, and how I interpret my different experiences as related to the way the labor process was organized. The organization of the labor process will be discussed in greater detail in chapter five. I have also showed not only how anonymization was an ethnical concern, but also how it affected data generation. Emerson et al. point out that "*what* the researcher finds out, is inherently connected with *how* she finds it out (2011, 15)." With the discussion of the "how" part in the preceding pages, it is now possible to turn to the "what" part: what it was the researcher found out. The rest of this dissertation will thus look to answer the research question of why Safe and Metal have different factory regimes. In order to do so, it is necessary to introduce the firms in greater detail. I will start by comparing the strategies of Metal and Safe in order to show how the imperative to accumulate was understood in the firms.

Chapter 4: Contexts and Strategies - Unpacking the Imperative to Accumulate

Accumulate, accumulate, it is Moses and the prophets! (Marx 1976, 742).

The imperative for firms to accumulate is the most important dynamic in capitalism (Marx 1976, Bottomore 2001). This chapter will demonstrate two different forms this accumulation process might take by introducing the firms of Safe Manufacturing and Metal Industries. For an imperative to have any effect at all, it must be unpacked locally as beliefs and practices. This chapter will reconstruct the worldviews in the firms which has informed their formulation of strategies for how to succeed in competition. The firms' strategies are a necessary starting point for the analysis of class compromise and its reproduction. Accumulation is necessary if the firm is to reproduce itself as a firm at all. The way actors try to achieve this has consequences for the reproduction of class compromise *within* the firm. Thus, in order to address the latter reproduction, it is necessary to establish a notion of the former reproduction, and that is what this chapter will do. Safe Manufacturing is involved in unit and small batch production of safety products for offshore installations and aims to branch out into the market for land-based construction as well. This has necessitated establishing relations with other firms and positioning Safe in a new market. Metal industries, on the other hand, aims to succeed in its traditional market of high-end aluminum alloys, and sees the cutting of costs as fundamental to achieving this. In contrast to Safe, Metal aimed to maintain their current market position. The focus of the strategy was on implementing ideas meant to make production more efficient, such as Lean. It follows from differences in strategy between Safe and Metal that my reconstruction of the strategies in this chapter focuses on different aspects. The story of Safe's strategy echoes its concern with the firm's relation to the market, while the story of Metal's strategy echoes its focus on cost-cutting in the labor process. Both strategies had profound consequences for the organization of work, but in different ways. This chapter is therefore the logical point of entry to understanding the differing factory regimes at Safe and Metal.

Safe Manufacturing and Metal Industries at a Glance

	SAFE MANUFACTURING	METAL INDUSTRIES
Employees (approximate)	100-200	500-1000
Ownership	Norwegian Private Equity Fund	Metal Corporation (Multi-national company)
Product	Safety products for the offshore industry	Aluminum
Market	Bid for tenders	London Metal Exchange
Located	Storesand, 75 000 inhabitants, administrative center	Lillevik, 6500 inhabitants, Industrial town
Turnover	In hundreds of million Norwegian kroner	In billions of Norwegian kroner
Founded	Roots back to 19th century	Shortly after WW2
Work day	0700-1500/0700-1800	Around the clock

Safe Manufacturing

Safe Manufacturing is a mechanical engineering firm operating in the offshore-supply market. It is located in Storesand, a medium-sized city in the Western part of Norway, known more as an administrative and commercial hub than an industrial center. Still, Safe Manufacturing has a long history here, repairing fishing vessels and other ships since the end of the 19th century. Today they have customers all over the world and claim to be the global leader in their particular niche, which is specialized offshore safety products. The company employs around 150 people, divided between three production sites, with the largest one located in Storesand along with its headquarters. Production at Safe resembles what Joan Woodward classifies as *unit and small batch production* (1965). Production plans are based solely on orders for products from customers, and the products are for the most part unique. Marketing is the first part

of the production cycle, starting with a salesman[24] selling an idea rather than a finished product to the customer. Contact between Safe and the customers is maintained until the delivery of the product, and Safe also sells service solutions, obliging Safe personnel to follow up the installed product over its lifetime. Safe Manufacturing bids for tenders on the global market for its products, in competition with both Norwegian and foreign firms.

Initial Overview

The premises of Safe Manufacturing in Storesand are dominated by three buildings: Fabrication, Final Assembly and Administration. The latter lies on a hill overlooking the other two. My stay at Safe for the most part took place in Fabrication and Final Assembly. In the former, production took place in a large hall with a number of workbenches where one or two workers put together the main components of the products. Usually, six to eight products are being worked on simultaneously. Around 90 percent of the workers in fabrication were from Eastern Europe, some with regular employment and some being temporary workers hired from a staffing agency. Connected to the production hall was the foreman's office, where I was given a desk to use as my base. The second floor housed the office where the blueprints for products were made: Technical.

Final Assembly was roughly the same size as Fabrication, but here 90 percent of the workforce was Norwegian, with only a small group of Eastern Europeans. A large production hall took up most of the building. A big office, with windows overlooking the work area, housed the leading workers overseeing the work in Final Assembly. This office also served as a gathering place during lunch and other breaks, and became my base during my time in Final Assembly. Outside the lunchroom/office were stairs leading up to the equally sized foreman's office. This office also had windows so that the foreman could oversee the activity in production from his desk. This was also where daily meetings between the foreman and the leading workers would be held. The

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[24] As far as I could discern, only men worked in sales at Safe.

executive responsible for production would come down for a meeting every Wednesday, where issues concerning production were discussed.

Production Overview

Sales is the starting point for the commodities made at Safe. After a contract has been signed, Technical have to operationalize the idea of the particular product into a set of drawings. At the sale end of things, parameters and specifications are geared towards what the product is supposed to do. Technical then have to convert this into a blueprint for something that can be made in Storesand. The current production at Safe had roots back to the 1980s, and the old timers at Technical were experienced in figuring out solutions for most problems presented to them by sales. In the 1980s, however, sales would sometimes sell products that the engineers had no idea how to make, so it was a lot of "learning by doing", as one informant remembers it.

From Technical, blueprints go to Fabrication, and lists of necessary parts go to the warehouse. The warehouse then fills a box with everything needed to make one product, which is picked up by workers from Fabrication. Larger parts have to be cut by laser and bent into shape with a metal bender. These CNC-controlled work stations (cutter and bender) were located in a separate room and controlled by one worker each. The warehouse was run by a handful of workers, overseen by the foreman of the warehouse. There was also a welding booth [*sveisebu*] where one man continuously worked on custom-made parts for the products, as specified by Technical.

The blueprint, the box with parts, custom-made parts and large cut and bended parts would then all come together in Fabrication for assembly. Here 10-15 workers continuously worked on putting the parts together on separate tables, using a combination of welding, screws and sometimes glue. Work here was overseen by a leading worker [*bas*] and the foreman of production, Mathias. Several different products were under production at any given time on the different tables. When

fabrication was complete, products were moved by truck to final assembly, a building next to fabrication.

The first stop in Final Assembly was surface treatment, which either consisted of applying paint or of brushing. Painted products would sometimes need to be sandblasted beforehand. Both the sandblasting station and the brushing station was manned by one worker each, while the painting hall was operated by 2-3 workers, overseen by a leading worker, Åge. From painting, products moved into a large hall where the final parts were assembled. As in fabrication, this happened on work benches operated by 1-2 workers, and often several benches were occupied by different products. Here, production was overseen by two leading workers, Odin and Mads. After completion and necessary tests, products were ready for preservation, the term used to designate packing for shipment to the customer. The product's way through the production process was a complicated affair, with timetables and priorities subject to sudden changes.

The general schedule of the work day followed a principle of five-minute breaks every hour. Workers had decided to add these together, so that there was a break of 15 minutes at 0845, 30 minutes lunch at 1130, and another 15-minute break at 1345. Most of the Norwegian workers worked from 0700 to 1500, while the Eastern Europeans, both regulars and temps, worked until 1800 in order to save up time to go home for longer periods.

At the time of my fieldwork, Safe was busy trying to branch out from the offshore market into onshore construction projects. As I would come to understand later, this shift in strategy had consequences for the activities I observed during my time on the shop floor. In order to grasp the logic behind this attempt at reorientation, however, a short recap of Safe's history is necessary. This is because the current strategic vision at Safe paralleled Safe's rise to prominence in the 1980s in important ways.

From Bankruptcy to Growth by Standardization

Since its beginnings in the 1800s, Safe Manufacturing has been geared towards the needs of the offshore market. Construction of fishing boats and passenger ferries, as well as repairs, have kept the firm in business for close to 100 years. After the discovery of oil on the Norwegian continental shelf in 1969, Safe Manufacturing and similar firms along the coast would soon find themselves drawn into the orbit of the burgeoning industry. The state created its own oil company, Statoil (now Equinor), with a goal to secure Norwegian influence over oil extraction. Statoil was also used to develop a Norwegian supply and service industry in order to serve the extraction activities on the continental shelf (Ryggvik 2015). It was in this new political-economic environment that Safe would try its luck. Safe's first entry into the oil-supply market, however, ended in bankruptcy. In the early 1980s a large project for an oil company failed, and consequently brought down the whole company. After the bankruptcy, fresh capital was brought in to continue production. The new start also marked the beginning of specialization towards safety products for the offshore market. With a rising concern for the safety of offshore oil extraction, this was seen as a promising market, and it would continue to grow for several decades.

Standards are fundamental to the question of offshore safety. In order to construct a product that provides safety, some agreed notions of what exactly this entails are required. Furthermore, this notion of safety has to be operationalized into product specifications, providing answers to questions such as how long a particular girder can withstand the wind and waves of the North Sea, or how hard a blast a machine can absorb and still keep functioning. In the 1980s, companies would have their own internal specifications and the knowledge of what worked where would travel between the oil companies, who were the customers of the supply industry. Einar, an engineer and old timer at Safe, described how they were the only company making this specific product in the early 1980s. I was particularly curious to know how this production was done before the evolution of standards:

Me: But at this point, there were no widely accepted standards for how things should be done?

Einar: No standards at all, none at all.

Me: So everyone had their individual specifications?

Einar: Yes, it was mixed together from various projects, you know there were just small groups of people spread around the globe working with this. So an engineer or an architect working with this on one platform, when he moved to another project, he would bring some specifications with him, and implement in new projects. So if you look at all the specifications that you can find, all over the world, you will see the content is similar or the same. They have picked up bits and pieces here and there, and put together their own versions.

Me: So the engineer's profession is where this knowledge flows around?

Einar: Yes, and architects, marine architects they are called, they work on those kinds of things.

However, this state of affairs would change in the coming decades, which saw increasing standardization of offshore safety. In 1993, the government took the initiative to develop a formal standard for technical solutions on the Norwegian continental shelf, the NORSOK[25]. The goal was to ensure the competitiveness of the Norwegian oil industry by ensuring competition between supplier firms. Having a set of common standards made it easier for oil companies to replace one supplier with another, thus avoiding situations where a specific supplier gained too strong a position in the market (Ryggvik 2015). The NORSOK would also play an important role for Safe's positioning in the market.

A Norwegian standard gave a competitive advantage to local companies and subcontractors because technical standards differed between countries, as the standards had to comply with different national regulations. Thus, Norwegian companies with their familiarity with the NORSOK would have an advantage over

[25] An abbreviation for "Norsk sokkels konkurranseposisjon", aiming to increase competitive advantage in the Norwegian industry.

foreign companies where this standard was in use (Ibid.). In effect, this created an institutional fence around the market on the Norwegian continental shelf within which firms like Safe could succeed (Ryggvik 2015). Safe Manufacturing would not only prosper in this relatively protected environment, they would also contribute to the form and shape of the fence itself.

Due to Safe Manufacturing being among the first producers of these particular safety products, the engineering office in Storesand became an important hub for the technological expertise regarding its standardization, which again allowed engineers at Safe to have an influence on the formation of the new standards. Einar explained that this still was the case:

> Today they are a small group of 12 engineers and architects who sit and evaluate the standard, and then they contact firms such as Safe and wonder if we have any suggestions for improvements. So we come with inputs into the standard all the time.

Thus, Safe Manufacturing was not only competing on the market for offshore safety products; through their contribution to the standards, it also played a role in operationalizing safety. This had been important for Safe since the beginning of standardization of offshore safety. Einar explained how this might work in practical terms:

> It has been important in the sense that we have had the opportunity to come with our suggestions and inputs [for improving it]. And then, when many firms bid for a specific contract, the customer sees that "aha, Safe Manufacturing, they actually meet most of what is stated here", while a foreign company might not be able to meet all the specifications [of the standard]. So it is important to come up with suggestions for revisions of NORSOK. Many might say that it isn't fair, but if they are going to develop the standard at all, they need to keep in touch with the producers of the products [that the standard is supposed to regulate]. So we work closely with many actors, the Norwegian Maritime Directorate, and several of the large companies who are working with this, such as Lloyds and Veritas.

The walls of Einar's office were filled with shelves full of ring binders documenting various standards and specifications. Safe's participation in developing standards, however, also bore consequences for the organization of work. This was because Safe's participation in standardization was grounded in the firm being at the forefront of product development. This entailed constantly coming up with incremental improvements to products, with a consequence that, for the most part, products were unique. In this way, the participation in developing standards for products meant that the labor process at Safe became harder to standardize since products often differed considerably from each other (this will be further explored in chapter five).

The growth of Safe Manufacturing as an offshore-supply firm took place in a period characterized by increased standardization in the market for its products, and Safe played a role in this process. The knowledge and skills from the production of safety products enabled Safe to position itself in the market. For the Norwegian government, the goal of standardization was to encourage a competitive offshore supply industry. But another effect of standardization is that is creates barriers to entry in the market, because firms need knowledge and skill to produce according to the standards, or might need to get certificates to prove that they are capable of doing so.

> Former Senior Executive: We have always been focused on acquiring certificates. It isn't easy for our competitors to get all the necessary papers. You need to invest both time and money. And there is a risk as well; say you spend 1 million on certifying a product, then demand plummets. Then you have a problem. So they work as a barrier to entering the market.

If the 1980s and 1990s was a time where Safe grew in a standardizing market, it was also a time where their production in Storesand increasingly focused on their niche of offshore safety. This would prove fortunate given the rise in oil prices and offshore investment on the Norwegian continental shelf that took place during the 2000s. As the former CEO put it:

Former CEO: 2000-2015 was a Klondyke period, with a lot of investment on the Norwegian continental shelf and globally.

But as all things end, so did the "Klondyke period" for Safe Manufacturing.

A Plummeting Oil Price

In 2014 oil prices fell considerably, and the good times came to an end, a change aptly described by a senior executive:

Up until 2014 there was no doubt about it [everything was going well]. We could never produce enough to satisfy customer demand, it was crazy [*det var armer og bein* [26]], just getting things out of here as fast as possible. Hardly any questions about margins either, but after the oil price fell in 2014, it became another world completely.

This other world was a world were offshore investment fell heavily and oil companies cut costs everywhere, a change felt with full force at Safe Manufacturing from 2015.

Senior Executive: In 2014 everything looked bright. High activity. We delivered [several hundred million] in product-related turnover. Focus was on increasing production capacity and improving margins further. Oil and gas was the main focus, with around 90 percent of revenue from this market, and we invested in a new production facility in Storesand.

Right before the drop in oil prices, Safe Manufacturing were bought by a private equity firm (Equipriv) looking to develop the company further in order to sell it at a profit a few years later. This entailed a change in top management. After selling their stocks to the private equity firm, the senior managers that had steered Safe Manufacturing through the "Klondyke" period were on their way out. They were replaced by a whole new team of executives. A senior executive at Equipriv described the modus operandi of the private equity form of ownership in this way:

We have a strong separation between the board [of the company] and the administration, but we are very active in the boardroom. PE ownership entails

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[26] Literally, there were arms and legs everywhere, used to signify a situation with little coordination, just work as fast as possible to get products out.

that you often want the majority [of the board] in the company so you can call the shots. [It is about] putting together a good board and a strong CEO. We are not engaged in the day-to-day running of the company, unless with the agreement with the CEO. I have weekly meetings with the CEO, and we have a larger business review every month. This is something other than a purely administrative board [..].

Thus, the first half of the 2010s represent a series of changes at Safe; new owners and new management, along with a steep drop in the oil price. This meant that the timing for the new owners could not have been worse. The Safe they bought was a firm where all graphs pointed upwards and investment in the offshore industry was high. The firm they ended up with was a firm dependent on a market from which the bottom had fallen out. This would provoke a reorientation of Safe's strategy and vision, as well as cost-cutting and downsizing of production at Storesand:

Equipriv executive: The oil price crash forced us to think fundamentally differently about strategy.

The Market Imperative of Private Equity

One of the major questions in coming up with a new strategy was whether production should be moved abroad. This could mean lower costs, especially in wages. However, the board, with its PE majority, decided to remain in Storesand:

Chairman: The reason we chose to go forward from Storesand is that it is much more secure when we talk about EHS[27]. Much more than if it was produced in China. It is an added value that it is produced in Norway, a clear advantage to be "Made in Norway". And our product is an EHS product in every way. It is not given that the brand recognition Safe has, would follow us if we moved production abroad. Another reason for staying in Storesand is the closeness between engineers and the physical production. Even though there are a few hundred meters between them here, China is much farther away.

Thus, the link between EHS and the brand name of Safe Manufacturing was one of the major motivations to keep production in Storesand, not the EHS quality of the

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[27] Environment, health and safety.

production itself, but the association between EHS and Safe's brand name, which is closely connected to production taking place in Norway. The chairman saw this as directly related to the standardization and NORSOK regulations described in the historic overview earlier:

> Me: You mean that the product contributes to raising EHS at the customer, not EHS standards in production here?
>
> Chairman: Yes, at the customer end of things. The NORSOK is very important. The perception of product quality would change if we moved production abroad, and the quality itself might also have changed. In Storesand you can almost do product development during production, you do not have to do it before you start production, but you can do it while you produce the order.

Thus, in the view of decision-makers at Safe, producing in Norway is advantageous because it is connected to customers' perception of the quality of Safe's product. Owners were also concerned quality might have dropped if production (Fabrication and Final Assembly) were moved away from the design taking place in Technical. Therefore, the new strategy for Safe Manufacturing would have to be a strategy for success *from* Storesand. Staying in Norway was beneficial for Safe's brand, and in addition, the closeness between design done by engineers in Technical and production taking place in Fabrication and Final Assembly was seen as advantageous. It makes it easier to maintain quality and allows for product development in production.

The new strategy would mainly be formulated by Safe's PE owners and the senior executives brought in after the takeover. It would be made based on their interpretation of Safe's market situation and estimation of Safe's resources, with a goal to help the company rebound after the oil crisis. In addition, the owners looked to sell Safe with a profit in the coming years, as they had already owned Safe longer than they planned when they bought it right before the oil price collapse. Success in this sense, then, was not only making money at Safe, but making money in such a way that the company would be attractive for buyers in the near future:

Chairman: It is no secret that our perspective is to sell Safe within the next 2-3 years.

The change in ownership from the former executives to Equipriv hence marked a change in the criteria for success. Where the former owners had been concerned with *sustainable business development* and growing a little every year, the new owners sought to increase Safe's share value and sell it at a profit within a short time. The "industrial" logic of unit and small batch production of safety products were subordinated to another logic: that of increasing the value of shares. While industrial production was undoubtedly important for increasing share value, it was no longer the end goal. Success in the market for their products was now a means to an end, which was the sale of Safe Manufacturing at a higher price than Equipriv had bought it. The imperative to accumulate in markets for industrial products was therefore subsumed under another imperative: the making of money by buying and selling firms in financial markets. The new strategy, therefore, not only had to succeed in steering Safe through the dire waters of falling oil prices; it also had to ensure a significant increase in the value of the company within a few years. As will be evident later in this chapter, this short-term strategic view stood in sharp contrast to the long-term strategy at Metal, where the goal was to maintain their competitive edge. For the owners, who defined the parameters of success at Safe, survival was not enough. Safe had to make huge gains in profitability in order to boost the price potential buyers would be willing to pay. The question thus became: what kind of strategy could accomplish this?

Achieving Rapid Growth by Reorientation

The new strategy devised by the board and senior executives can best be summed up as one of reorientation. It was decided that Safe should both try to branch out from the offshore market to the market for construction projects on land, and go from a supplier of products to a company that could take on general contracts. A senior executive central to the process of formulating the strategy explained how exploring the needs of potential customers was important for this choice of direction:

Magne: At the start of the strategic process, we asked: How can we position ourselves in the market? Income from offshore activities will be low for the foreseeable future. Based on that assumption, we started to analyze the market. We saw that our products and competencies could be used in alternative markets. So we decided to enter the market for land-based construction projects. We spent a lot of time discussing with actors in the market, and realized we could establish a new business model.

Instead of selling their products to a general contractor in charge of some part of a construction project, Safe's new business model was to take responsibility for contracts themselves. The types of contracts Safe aimed for were the ones where their safety products were singled out as its own contract. For example, instead of delivering staircases to a general contractor, Safe was interested in getting responsibility for all the staircases themselves. To be able to accomplish this, Safe hired employees who could serve as project managers, and entered into several strategic partnerships with firms who could manufacture the parts for the installation Safe could not make themselves. Among the senior executives, the move from supplier of products to general contractor was seen as a crucial innovation to bring the company forward. Morten, another senior executive, explains the reasoning behind the push to become a general contractor:

Morten: When we deliver to the wharfs, they handle installment of our products, while we might advise them on how to do it. [..] But when we deliver to construction projects, you cannot deliver anything there without also providing installation. So to grow in the construction market, we had to take responsibility for installation as well. We know that is risky, not that the margins are great either, but we just have to do it. [The customers] expect that we are our own project leaders, that we do the planning, and get the other necessary products. We don't get anything from others, we have to ensure that EHS, quality and everything is in order. [..] Our selling point now [towards the big actors in the market] is that we can be general contractors and develop our organization in that direction.

From the viewpoint of the executives at Safe, the move from supplier of niche products to a general contractor in their niche was something new in the construction market.

It was a development welcomed by the market, where big actors hoped that Safe could spearhead a development towards bigger enterprises. Safe's response to the collapse of oil prices was thus to branch out from the offshore market into the market for land-based construction, while at the same time becoming a firm capable of handling projects themselves, rather than just supplying contractors with products. This meant that the projects in which Safe stepped up to become a general contractor took on a much wider significance than the revenue. The role of a few large projects had to show the new market that Safe was indeed a general contractor that could be relied upon to deliver on time and according to specifications. Unlike at Metal, where the cutting of cost was the main goal, at Safe the successful fulfillment of a few key contracts became the overriding goal. This carried with it several consequences for the organization of work, such as need for a flexible labor force open to working a lot of overtime (see also chapter six). Furthermore, the move into a new market with new types of customers and new product specifications greatly increased troubleshooting on the shop floor (see chapter five). It also disturbed the flow of production, because the frequency of unforeseen events increased with the unfamiliar products and production techniques. These disturbances would in turn have consequences for the organization of work and greatly increase the need for the coordination of tasks.

The strategy of reorientation shares noticeable similarities with the success Safe had in the market for offshore safety 1990s and 2000s. The NORSOK entailed increased standardization of offshore safety products. Likewise, the executives at Safe saw signs of increasing standardization of construction on land. A new set of fire regulations from the EU, as well as increased demands for security motivated by terrorism, pointed towards increasing standardization of products. Magne the senior executive explained that the goal was a market share of 50 percent in the relevant safety niche. This was possible because increased standardization would increase the importance of expensive certificates:

With the new directives for fire coming from the EU, every product needs to be tested in accordance with the new parameters. Obtaining the certificates and increasing employee competence is quite expensive for us, but the upside is that many will back out because they cannot bear the costs. So we believe in a market in the future with fewer suppliers.

Here, Magne the senior executive almost echoes the former executive's view on the advantages of certificates barring marked entry. Thus, while Reorientation represented a break with the former strategy of sustainable business development held by the previous owners, it was also an attempt to do what Safe had done during the 1990s and 2000s. It was an attempt to position the company in a market where the cost of entry was increasing due to more rigorous product standards.

Summary of Safe Manufacturing

This presentation of Safe Manufacturing has demonstrated several key points that will be important in the analysis that follows in the coming chapters. Since the 1980s, Safe had benefitted from being in a market facing increased standardization. By being at the forefront of this development, and contributing to the standards themselves, Safe was able to position itself as a leader in its particular niche for safety products. Being at the forefront of product development also meant that Safe's products would often be unique from batch to batch, or even within batches of products. This was both a consequence of spearheading technological development, as well as the offshore platforms' need for custom-made products to be installed.

The oil-price crash triggered the process of coming up with a new strategy at Safe: the strategy of *reorientation*. Before the crash, profit was made by selling safety products to the offshore market. The new strategy entailed a branching out into the safety market for land-based construction projects – a horizontal shift from one market to another. There was an additional vertical shift up the value chain, from a company that sold inputs to wharves and general contractors to aspirations of becoming a general contractor.

The new strategy was based on the need of the new private equity owners for a rapid turnaround from the oil-price crash so that they could sell Safe Manufacturing to another investor. Hence, the parameters for success were not only success in industrial production. Instead, industrial production had to be successful in such a way that it would significantly raise the price a potential buyer of Safe was willing to pay. Hence, the logic of making money by selling manufactured products was subsumed to the logic of buying low and selling high in financial markets. Among the means to achieve this was the hiring of a "strong CEO" and being "very active in the boardroom" on the part of Equipriv.

The changes following from the new strategy entailed changes in the organization of work. The entrance into a new market and aspirations of becoming a general contractor meant that a few large contracts took on a significance beyond the potential profits. Fulfilling contracts on time and according to specifications became important for establishing Safe's reputation in a new market. This had several consequences for the organization of work. To fulfill contracts, a flexible labor force willing to work large amounts of overtime was needed. New customers and new products increased troubleshooting in production and the occurrence of unforeseen events, which in turn brought about an increased need for coordination of work. These changes will be explored in the coming chapters. Still, the strategy of positioning Safe in a new market had parallels with Safe's earlier success of producing for the offshore market in a period of standardization. The move to land-based construction mirrored this as executives also predicted increasing standardization in the new market.

Safe's strategy could be understood as having an external orientation, as strategic partnerships and the fulfilling of contracts took precedence over streamlining the labor process. Hence, the way the market imperative was understood at Safe differed considerably from Metal Industries, where the focus was on streamlining the labor process in order to make productivity gains.

Anatomy of a Cost-Cutting Game: Metal Industries

Metal Industries was not in a process of reorientation. They were, as one of the managers put it, "playing a cost-cutting game". The meaning of this was that the economic logic in the market of Metal Industries was characterized by a competition to cut costs in order to produce cheaper goods than their competitors. The price for the aluminum made at Metal in Lillevik is established at the London Metal Exchange, where aluminum has been traded since 1978. Thus there is a market price to sell the aluminum at, putting Metal in direct price competition with other producers of aluminum. As we shall see, this competition and Metal's place in the market was emphasized by management in their communication with operators. Before meeting the managers, however, it is necessary to give an overview of the organization of aluminum production.

Producing Aluminum

Aluminum is typically produced by the use of electrolysis, in what is known as the Hall-Héroult process. Aluminum oxide, usually refined from bauxite, is added to a bath of liquid cryolite[28]. The bath is heated to liquify the contents, allowing electricity to pass through it. Electricity enters through an anode, flows through the solution, and exits through a cathode. As a consequence of electrolysis, molten aluminum sinks to the bottom, where it is tapped off. Liquid aluminum can then be cast directly, or different metals or other elements can be added to make an alloy. The advantage in making an alloy instead of pure aluminum is that it endows the material with different qualities. Aluminum used for soda cans, for example, requires different qualities than aluminum used in car production. As the production of alloys is more complex than that of raw aluminum, aluminum alloys are more expensive. At Metal Industries, production was geared towards the making of alloys aimed at the advanced part of the market for aluminum. They also produced their own anodes in what was called the anode bakery.

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[28] Typically synthetic cryolite, as natural cryolite is too rare to be used on an industrial scale.

Inputs to production at Metal Industries arrived by boat. Alumina and other inputs for metal production entered Electrolysis, where raw aluminum was made. From there it was transported by drivers to the Casting Hall, where the desired alloys where made, before being transported back to the harbor and shipped to the customer. Inputs for anode production went to the refinery where materials were prepared to be baked into anodes at the Anode Bakery. From the Anode Bakery, anodes were brought to electrolysis to be used in the baths. All of these buildings were large industrial halls, with safe walking routes marked by green lines on the floor. These were areas where helmets, glasses and other protective equipment had to be worn at all times. When not working, operators (the title of workers) would gather in areas used to both rest and observe the status of the production process. It was in these areas that I spent most of my time at Metal, in addition to accompanying operators out into production. As my fieldwork at Metal was divided between the Anode Bakery and the Casting Hall, the overview of production at Metal will focus on these two locales.

The "Fire-Haul" and Rhythm of Baking Anodes

The Anode Bakery was a large industrial hall with a large number of pits where anodes were baked. Large traverse cranes continuously moved finished anodes out and fresh ones into the pits. The pits themselves were rectangle-shaped with the two longest walls being built on site with special bricks that allowed hot air to flow through them. Over time, these walls would be worn down and had to be replaced by the bricklayers working with a crane. The heat for the baking came from gas burners placed on one side of the pits, and then fans and suction devices were used to create a stream of hot air through the walls of the pits, so that the anodes were baked. The burners and the system of fans and suction devices were moved according to a baking schedule, and took place at regular intervals on every shift, dictating when and how the rest of the shift's tasks had to be done. The "fire haul", as it was known, would involve most of the shift, as a lot had to be done by hand on the ground, as well as in coordination with the crane driver above.

It is impossible to convey the experience of being present in production at Metal Industries. Still, this excerpt from fieldnotes from the first day in the Anode Bakery serves to illustrate some of the complexities of production:

> Field diary: I am introduced to Oda whom I will follow around for today. We first go to the control room, furnished with several computers and large screens, which give an overview of important parameters of production. Oda tries to explain the task of fire-hauling to me. I pretend to understand much more than I do. I accompany her out into the production hall, and she explains the EHS rules. [..]. She tells me to put my facemask inside my helmet instead of in my pocket, so that I always know where it is in case of an emergency. [..] Oda is responsible for fire-hauling at this shift, and need to make sure everything is in order. She checks the temperature in the pits with a long metal rod, and also the level of different gases in the air being pumped out.

During my time in the Anode Bakery, I would come to understand the fire-hauling as setting the rhythm of anode production. The carbon-made anodes had to be baked at certain temperatures for a certain amount of time to reach the desired density and composition. The timing of the fire-hauling was therefore critical, and its timing was always among the first things to be discussed at overlaps. Since it required most of the shift working together, the performing of other tasks had to fit the schedule set by the baking of anodes.

> Field diary: Later, Oda enters the control room which doubles as a break room and asks if I want to join her on an inspection. I do. The inspection consists of Oda preparing the fire-haul by covering the coke-filled pits with plastic. This has to do with the fanning system forcing hot air through the walls of the pits. She cuts some holes in the plastic over some lids. Two of them have a broken gasket and need to be changed. She calls up the crane over the radio and he comes with a rig and some equipment. Oda has worked here for 10 years, and acquired her letter of apprenticeship this spring. She used to work at some other place at Metal before she started the fire-hauling. It takes more than a year to fully master it, she explains. Before she worked on a shift with only new people: It is really difficult to work with people who don't understand the processes going on here, she says. [..] Fixing the pits is a real puzzle, as you cannot change the walls when they are being used for baking. We are lucky that they guy in charge

of that is a former operator here. It has to be someone with knowledge of these things.

Oda and other operators would often emphasize the importance of working with experienced operators, and how experience-based knowledge was important for the smooth running of the baking process. Mastering the task of fire-hauling came down to interpreting various parameters correctly. If the temperature in the pit was not rising according to the expected curve, what might be a likely explanation? Was the composition of gases coming out of the exhaust as expected? And could this particular gasket be used for one more baking, or did it have to be changed immediately? These types of questions were part of the everyday problem-solving in the bakery and were often topics for discussion during breaks.

Keeping the Aluminum Flowing: The Casting Hall

The Casting Hall was a large industrial hall as well, but it differed from the Anode Bakery in being much more compartmentalized. There were specialized areas for different operations, quite different from the vast hall of the bakery. I spent most of my time in the control room on what was known as "the backside", referring to it being on the backside of the casting ovens. While the frontside was where metal would flow to the casting pits, the backside was where different metals were added to the ovens to reach the desired alloy. Work here consisted of loading aluminum and other elements into ovens, where different processes took place to prepare the metal for casting. When ready, the metal would flow in canals from the ovens to the casting pits, where another group of workers would take over. After casting, the large slabs of solid metal were moved by traverse cranes to one of two saws, where an operator cut slabs into their final form and performed various quality-checking procedures. The Casting Hall was usually manned by 15 operators and three engineers, with engineers working daytime and operators day, afternoon, and night shifts. The flow and composition of the metal is overseen by an operator in a control room, the batch coordinator.

As in the Anode Bakery, timing and coordination of tasks structured the work day in the Casting Hall. While liquid metal behaved differently than anodes, it also demanded that certain operations be done at specific times. The key in the Casting Hall was to avoid the solidifying of the liquid aluminum. To avoid this, there had to be room for the flow of liquid metal coming from Electrolysis. The liquid metal from Electrolysis arrived in concrete containers, put on a holding shelf. From that point in time, the clock was ticking as the metal slowly cooled. The machine drivers, responsible for filling, needed to get them in the right oven before the temperature dropped too much. The coordination of incoming aluminum, where to put it and when, was done by a batch coordinator, one of the roles on the shift in the casting hall and similar to the role of fire-hauler in the bakery in that it coordinated the flow of work according to the material demands of production. Thus, the qualities of the various elements, such as melting temperature, viscosity, and so forth, enforced a number of absolute parameters on production at Metal. Certain tasks could not be postponed to a better time, but would have to be completed at a given time. Thus, the characteristics of the industrial process posed certain demands on the organization of the work. An excerpt from field notes illustrate how this looked on the micro-level of social interaction:

> Field diary: Today will be hectic, as they only have access to the crane until 1130. They need to use it for the weekly change of [type of industrial filter]. They discuss what tasks they have been left from the night shift. Apparently, there was less metal last night for some reason. This slack will be picked up over the course of the coming weeks, I understand. The machine drivers will have a quiet day, with only 16 trips, compared to the normal of 23. Someone on the radio demands that a truck be moved so he can move some machine he calls "Anne". [..] When they don't get enough metal from Electrolysis to keep the ovens going, they have a reserve of metal they can use to fill the ovens. Typically earlier slabs of metal where something went wrong (wrecks), so it has to be recycled. But they have to match the chemical components with what they are making. Wrecks that contain Byrill for example, cannot be used in food-grade aluminum.

The constant flow of liquid metal from Electrolysis is the key aspect structuring the work day in the Casting Hall. The pace of the work and the chemical processes need to

be adjusted so that the liquid metal can be used before it solidifies. In order to achieve this, predictability is key – a sentiment echoed during an interview with the sales office.

> Me: So there is competition on all the products you make here?

> Sigmund the sales rep: Some products we practically have monopoly, but most of what we ship from here we have competitors.

> Me: Most things, not everything then?

> Sigmund the sales rep: No, the [type of product] we are the only supplier. We try to specialize in the difficult products, in order to obtain a higher premium. But this means that we have to have extreme precision in our processes in order to make money. It's like balancing on a tightrope. You need to have full control [*stålkontroll*] to make it work. We are far from the market with high wages, so we need to compete on things like quality and precision and these things.

The notion that control of the work and quality of the product were intimately connected was widespread both among operators and managers. And like Safe, Metal was aiming for the upper tier of the market, making metal that was harder than average to make, either because of the type of alloy, or the required size of the slabs of aluminum. The production process at Metal differed from Safe, however, in that the absolute demands of aluminum enforced parameters on the organization of production. If the fire haul was not done at the prescribed time, the batch would be wasted. Likewise, in the casting hall, keeping aluminum in liquid form until casting time was absolutely necessary to avoid damages on equipment and huge delays. This meant that the production of aluminum was in many ways more predictable than the manufacturing of safety products at Safe, where customers could change their minds or disagree over whether the product fulfilled the criteria or not. Chapter five will go into the consequences of this difference for the organization of work.

Operator Responsibility

The day shift starts at 0645 by meeting the night shift in the control room and getting to know the status of production. This is known as "the overlap", an informal meeting

between two shifts of operators, consisting of a mix of knowledge exchange, information and banter intertwined into each other. After the overlap, what is to be done by whom is decided on by the shift, and coordinated by the operator with the role of batch coordinator, meaning s/he has the responsibility to keep track of when metal is coming in, when different processes should be done, and coordinating the work of the machine drivers who load other metals in the ovens to reach the desired alloy. A meeting takes place at 0900, where management and operators update each other on the situation of the casting hall, planned maintenance, problem-solving, and so forth. After this meeting, operators work until the next overlap, which starts at 1445. At 1500 the managers and staffers go home and the plant is basically run by the operators until the next morning. This was done by the afternoon shift and the night shift. This means that a whole host of decisions regarding production is taken by operators. The broader questions and planning of alloys are handled by engineers, but their execution is to a large extent left to operators, without managers. The casting hall is a place of liquid metal and large machines, so there are strict EHS rules for where one can go. A green track at the floor designates safe areas to walk.

At Metal Industries, the way the shifts are organized is named autonomous[29] teams. Some 20 years ago, foremen were removed from the shifts and the task of overseeing work was partly transferred to team leaders with responsibility for several shifts, and the rest to the workers on the shifts themselves. Before this, every shift had a foreman working day, afternoon and night shifts, and every section had a section foreman, meaning that two levels of managers were accompanying shifts. The team leaders work in the daytime only, and typically have responsibility for two to four shifts. The workers on the teams have different roles: one coordinates personnel, making sure they are enough people on the shift if someone is sick, while others have responsibility for different work stations or EHS issues. The day-to-day running of the casting hall is

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[29] Here, *autonomous teams* is used because it is used in the smelter; it is thus used as an emic concept. I will therefore not go into theoretical discussions regarding worker autonomy, but instead focus on what it means at Metal.

largely left to operators, while the team leader is there if some unforeseen problem arises. Thus, operators have been delegated a degree of responsibility in deciding how best to perform their jobs and solve the problems that arise during production. While there are differences between the different parts of the smelter, the organization in teams permeates the whole production line. Electrolysis, the anode bakery and the various supporting shops are all run on the basis of the autonomous team, a sign that the ideas of the NCM, prescribing increased worker responsibility as an advantage, had found fertile ground at Metal.

The rationale for the autonomous teams, I would learn, was closely connected to the premise that cutting costs was necessary to stay competitive. Autonomous teams were part of the answer to the question of how to cut costs. One of the ways the necessity of cost-cutting was propagated through the organization was through the *Lean day*, an obligatory one-day course for operators that I got the chance to attend as an observer.

The Lean Day

Both trade union and management agreed that cutting costs was the main challenge for Metal Industries in Lillevik. I got my first glimpse into the discourses on cost-cutting at Metal Industries when I was allowed to participate in one of the firm's "Lean days". The production ideology of Lean was seen as an integral part of staying competitive at Metal, but adjusted to local conditions, as Marius the manager underlines in this excerpt from a discussion about the introduction of Lean at Metal:

> Marius: Yes, the interpretation [of Lean]. We were very aware, that turning the Lillevikians [people from Lillevik, here meaning the people at Metal] into Japanese people, we can just forget about. Toyota works well in both Japan and in Toyota, because it was created there. [..] But you cannot work like that here in Lillevik.
>
> Me: What did you have to remove?

Marius: Well you know, the Japanese are the way people often are in the East. They say yes to everything. We had to remove all the bells and whistles [*staffasje*] from Lean, we had to remove all the culture stuff that comes with it. But, the theory, that we took in, and adjusted into Norwegian. And by that I mean you also had to adjust it to the tripartite system, you don't have the same type of union in Japan as you do here. [..]

Me: So you translated Toyota to Norwegian?

Marius: To Lillevikian.

While this conversation is about the introduction of Lean at Metal, Lean was still, some 20 years later, seen as the way forward for the smelter. Here, Marius almost echoes Olsen's observation of the intertwinement of management ideas into industrial relations (see *Norwegian cooperative model* in theory chapter), stating that Lean has to be adjusted to fit with the tripartite system in Norway. The function of the Lean day was to implement Lean thinking among operators. But the day was also a window into how management understood the particular logic of the market in which they operated. It was also an example of how management sought to create a specific organizational logic; seeking to establish a particular narrative of the world in order to mobilize operators to participate in the effort to implement Lean principles.

The seminar took place in a large meeting room at a local hotel, and around 100 operators attended, as well as 5-10 managers, who gave the different lectures. At the same time as the seminar, the neighboring meeting room hosted a meeting between the smelter leadership and representatives from Metal Corporation[30], who had come to Lillevik to discuss a new investment to increase capacity:

Presenter (manager at Metal): There is a large group in the other room just now, talking about investing 500 million kroner here in Lillevik. That gives us a whole new platform, it is so important that we get bigger than we are today.

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[30] As mentioned before: Metal Industries is the smelter in Lillevik, Metal Corporation is the multinational company to which the smelter in Lillevik pertains.

The first lecture is focused on the external situation for Metal, and a lot of time is spent on a curve, showing different costs for producing one ton of aluminum among different smelters.

> Presenter (Manager): As you can see, before the financial crisis, the best ones were at 1400 USD per ton, while the worst ones are at 3000 USD. We were just above 2000 USD. [Explains at some length all the smelters in Metal Corporation that have been closed as a consequence of the financial crisis and the drop in aluminum prices] 26 Smelters became 13 after the crisis. Before, there were over 50 smelters in America, now only a handful remain. All the expensive smelters were closed, only the cost-efficient ones remain. [..]

Competition from other smelters was not the only challenge facing Metal in Lillevik; the global market situation might also change in a dramatic manner:

> Presenter (Manager): Take China, in the early 2000s, they made 3-4 million tons of aluminum a year. Today, they make 30 million tons. That is the same amount as the rest of the world taken together. If this aluminum enters the world market, it will have dramatic consequences for the price [today most of the Chinese aluminum is used domestically, we are told].

In addition to the looming threat of Chinese aluminum entering the world market, some of the contracts on critical inputs for Metal were up for renegotiation:

> Presenter (Manager): In 2016, we were producing at approximately 1500 USD. In 2017, costs rose, and we were at 1700USD for one ton of aluminum. In 2020, we are heading towards 1900 USD, because our inputs are becoming more expensive. And also, the contracts on oxide are getting renewed. We had a great deal, but it's expiring now.

After this rather dramatic overview of the trends in the aluminum market, the conclusion for Metal's part was drawn:

> Presenter (Manager): This is the situation. The smelter can be closed. Think about the future young ones[31]. Do you want to travel to Storevik [neighboring

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[31] Still unclear whether this is meant to make the audience think about the future generations, or if the presenter is addressing them somewhat ironically as "young ones".

city] for work? We have the opportunity [to do something about this], that is why this day is so important! We have to be able to do like Toyota. Everyone is on the Lean wave, but very few succeed.

The Lean day was not only about implementing Lean principles of production. It was also about establishing a particular narrative about the world and Metal Industries' place in it. The implementation of Lean was embedded in a broader narrative on cost-cutting, which again was embedded in the larger story of getting more investments from Metal Corporation (the meeting taking place in the other room). These investments were a means to an even higher end, securing the jobs at the smelter in Lillevik. During my time at Metal Industries, I encountered this larger narrative both on the shop floor and during interviews with management. The story-telling that took place during the Lean day is thus an example of how a particular view of Metal, its place in the world and its importance for Lillevik was propagated in the firm (this point will be focused on in chapter seven).

Cutting Costs for a Higher Purpose

The theme of securing jobs for the future was a topic that resurfaced both in observations and interviews with operators and managers. Some examples from a discussion on effectivization and robotization are included here for illustration of how these ideas were expressed:

> Oddny: If Eagle closes down, I will leave this town.
>
> Ottar: If Eagle disappears, what do we do then, go down to Rema [supermarket chain] and apply for a job?

From a discussion in the brick shop:

> Ole-Martin: I think robotization is something we have to do in order to survive. It is necessary. I don't have that many years left anyway [until reaching retirement age], so it does not matter so much to me personally. But for Lillevik it would be a tragedy if Eagle has to close down.

The theme of being competitive in order to make sure Metal continued operations in Lillevik was also elaborated on by trade union representatives and managers during interviews. Both sides would explain the relation between them along the lines of "we have the same goal, but might have different ideas about the best way to get there", as one manager put it. Later, I would come to understand the concrete meaning behind this statement, namely that the specific goal was new investment in Lillevik from Metal Corporation. To get new investment, one had to convince firm leadership on a global or continental level that these investments would pay off. This involved plans for cutting costs, usually involving that workers would become redundant. I found that a helpful way to understand dynamics at Metal regarding investment was to see it as a repeating cycle:

Proposal for investment -> Investment and modernization - > Realizing gains - > New cycle

Several such processes could be going on at the same time, aimed at different parts of production. The "realizing gains" part of this cycle, is the part of the cycle where relations between management and trade union are most tense, as it was here questions of manpower and redundancies really came to the fore. This will be further explored in chapter seven. For now, we note that as a cornerstone firm in Lillevik, the fate of the town was closely intertwined with that of Metal Industries, and the importance of the smelter for the town would often be mentioned by operators and managers in talks about various projects aimed at cost-cutting. In addition, finding better work elsewhere was not seen as a realistic opportunity by most operators.

> Ola: Other firms do not only work here, they can have assignments elsewhere, like [name of industrial town]. So then you must go there to work for a week or two? Many of the people working here have never been [working] outside of this smelter. [..] Many of the managers started out as operators in their day [..].

Here, Ola illustrates how most operators viewed the prospect of working elsewhere with little enthusiasm. In addition, most managers, also at the top level, had had long

careers at Metal, and had often worked their way up from the shop floor. Thus, their careers were tied to the smelter in Lillevik.

While Metal Industries was pivotal to the existence of Lillevik, in the multinational company that owned it, Metal Corporation, it was one of several aluminum smelters. Metal Corporation is an integrated company in the sense that it controls large parts of the supply chain, from raw materials to refining. Metal Industries in Lillevik is not the biggest smelter in Metal Corporation, but is one of the smelters where new projects are tested out and research is done in order to see whether it can be implemented in the larger corporation as a "best practice". Metal Corporation's ownership of Metal Industries is with an aim of making a profit from year to year, as well as fulfilling a function in the larger corporate structure. In this sense, it is an example of industrial ownership differing from the financialized ownership of Safe Manufacturing, where the owners' goal is to sell the company within a few years.

At Metal Industries in Lillevik, then, the logic of the competition in the market was price competition relative to quality. And while Metal produced high quality products with less competition than simpler types of aluminum, they still saw price competition as the fundamental logic of the market. The overriding strategic goal was therefore to cut the cost of each ton of produced aluminum. At the same time, trying to get projects to Metal that would increase its annual tonnage, would create economics of scale and contribute to lowering the price per ton as well. When cost-driving factors such as the price of electricity or alumina changed for the worse, Metal in Lillevik would answer by increasing their focus on efficient work processes. The main way to do this was to organize according to principles inspired by Lean manufacturing ideology. As we shall see in the coming chapters, the strategy of cost-cutting would have specific consequences for how production was organized at Metal.

A Tale of Two Strategies

This chapter has demonstrated how the imperative of market competition is understood in the firms by focusing on the strategies of Safe and Metal. How do they

answer the question – What do we need to do in order to succeed in competition? As we have seen, Safe and Metal come up with different answers to this question. The conditions for formulating Safe's strategy are set by their new owners, who are out to sell Safe within a few years. Therefore, business as usual is not an option – a quick turnaround for rapid growth is necessary. This involves reorienting both horizontally and vertically: both into a new market and up the value chain into a general contractor. This makes contracts in the new market much more important than just the potential profit they generate. Contracts need to be fulfilled at all costs to position Safe as a reliable general contractor. This stands out in relief to the strategy of Metal, where the goal is to maintain competitive advantage by focusing on the cutting of costs – focusing on the labor process. Metal has been going down this road for a long time, and since the 1990s, Lean has been the preferred tool for achieving this, albeit adjusted to Norwegian, or "Lillevikian" conditions.

The strategies and market context were not the only difference between Safe and Metal. There were also differences in where the strategies were articulated from. At Safe, the strategy was formulated by the new group of executives, brought in by the new owners. It was approved by the board, then implemented in the firm. The relevant context for the new strategy was the oil-price crash and the need of the owners to sell Safe. At Metal, the strategy of cost-cutting had been followed for several decades. It was understood both on the shop floor and among managers (of whom many had worked their way up from the shop floor) that this was the way to succeed in aluminum. The goal of attracting more investments in order to secure jobs in Lillevik was the rationale for cost-cutting and the implementation of Lean.

This chapter has demonstrated how actors in the firm understood their external conditions of reproduction – What needs to be done in order to reproduce the firm as a firm? This external reproduction is a necessary starting point for the further analysis because it has consequences for relations in the firms, and their reproduction. The following chapters will focus on different aspects of the factory regime in the firms and

show how they are connected to external reproduction. I am not saying here that relations internal to the firm are mechanically created on the basis of the needs of external reproduction. Rather, these processes should be understood as parts of a whole, analytically separated here for the purpose of understanding. The formulation of strategy does not take place on a blank slate, but is itself informed by how the formulators of strategy see the firm and its resources.

By unpacking the imperative to accumulate capital as beliefs in the firms, it is now possible to turn to the question of what the role of these beliefs are in organizing production. Safe's strategy increased the amount of troubleshooting on the shop floor as new products and new types of customers demanded new techniques and different market relations than before. This strengthened the unpredictable character of the labor process. New customers behaved in different ways and had different demands than those Safe was used to dealing with. Troubleshooting meant that timetables had to be changed and tasks reallocated. One way to understand the imperative of competition at Safe is as a command of "fix this product now, in any way possible".

At Metal, the absolute parameters imposed by the demands of baking anodes and keeping aluminum temperature above solidifying levels structured work and tasks, making the labor process and distribution of tasks a much more predictable affair than was the case at Safe. As we shall see in the coming chapter, this enabled the detailed description of tasks in procedures, as tasks were relatively stable over time. At Metal, the important question was how to organize the labor process more efficiently, a question that was answered by delegating responsibility to teams of workers. If the imperative at Safe was about getting things done in any way possible, the imperative at Metal was understood as more along the lines of "do this in a more efficient way". The next chapter will compare the organization of the labor processes at Safe and Metal, providing the next piece in the puzzle of answering the research question by demonstrating both *how* and *why* they differ.

Chapter 5: The Labor Process

This chapter will compare the labor processes of Safe and Metal, and show how they differed from each other. At Safe, *simple control* by managers over workers was the main way to coordinate tasks and ensure *conversion*. At Metal, norms for worker behavior on teams led to the coordination of tasks by way of *concertive control.* The previous chapter demonstrated how the imperative of competition posed different challenges to Safe and Metal. This chapter will explore the consequences of the different strategies for the organization of work. At Safe, *reorientation* increased the need for coordination and flexibility in the labor process as priorities and the structure of task allocation were prone to rapid changes due to new demands from customers or unforeseen events, such as troubleshooting of new products. At Metal, the strategy of cost-cutting focused on making work more efficient. The organizational form of autonomous teams was seen as the way to do this, as the relative stability of tasks allowed for the compartmentalization of work into rule-governed spaces within which workers were delegated responsibility for task coordination.

According to literature on the *Norwegian Cooperative Model*, there is an ideal way to organize the labor process in the Norwegian context (see chapter two). This involves delegating a degree of decision-making to shop-floor workers, who are often organized in teams. This chapter will show how the different ways to organize work at Safe and Metal were grounded in local actors' understandings of the demands of production. Thus, contributing to answering the research question by showing why delegating responsibility to shop-floor workers was seen as relevant for solving the challenges posed by production at Metal, while not considered feasible at Safe.

The imperative to accumulate led not only to different ways of organizing work at Safe and Metal; the particular ways in which work was organized also produced its own effects. Simple control and concertive control structured interaction on the shop floor in different ways, giving rise to different experiences of work. Drawing on the work of Burawoy and Therborn discussed in the chapter on theory, I will understand these

different experiences of work as different forms of interpellation. While the different labor processes were geared toward producing different types of products, they also produced different types of people, or industrial citizens, to paraphrase Burawoy. Hence, the role of this chapter is both to explicate the role of the strategies on the organization of production as well as to show how the organization of production has consequences for the production of subjectivities. In turn, these subjectivities constitute the terrain upon which industrial relations are shaped. Hence, in order to answer the research question and understand the differences between the factory regimes, it is necessary to zoom in on the particularities of the labor process.

The Labor Process at Safe Manufacturing: Simple Control

The formal organizational structure at Safe Manufacturing was a pyramid where workers in production were led by *leading workers* [*bas*], with each leading worker typically having responsibility for one area each. The leading workers reported to a foreman responsible for that particular area of production: one for fabrication, one for final assembly, and one for the warehouse. At the top was the production executive, who both oversaw production and belonged to the executive group at Safe. His office was in the administrative building, while production was divided into the warehouse, fabrication and final assembly. Each morning there would be a meeting between the foremen and leading workers to plan the day's tasks. Every Wednesday there would be a larger meeting, which the supply-chain manager and several other people from staff also attended. "That is when the big chiefs come down here and we blow off some steam" as Mads, a leading worker, explained. An organization can be hierarchically structured in theory, but might still leave a lot of room for employee decision-making in practice. In order to understand how this worked in practice at Safe it is necessary to delve into the practices taking place on the shop floor. This will demonstrate how workers were subjected to managerial authority when it came to which tasks were to be done when and by whom. Hence, the *relative independence of workers in production*, prescribed by the NCM (Levin et. al 2012, Ravn in Bungum, Forseth Kvande (eds.) 2015), was not prominent in the labor process at Safe. Rather, the managerial

hierarchy coordinated production and acted as conduits of knowledge of what needed to be done. In the following I will discuss aspects of the labor process at Safe, showing how control worked in practice on the shop floor and how the unique character of its products made the standardization of tasks difficult. Furthermore, I will go on to show how the simple control at Safe interpellated a particular type of worker, one that learned to wait for instructions of what to do.

Control in Practice

An early encounter with control in practice came in the process of negotiating access to areas where I wanted to observe production. I quickly learned that employees would hesitate to make decisions regarding my observation of work without clarifying with their supervisor first. These notes from my field diary illustrate how workers involved management in different situations.

> From field diary: I met a worker from the warehouse with whom I had a good chat, I followed up by saying that the warehouse seemed like an interesting place and it would be nice to come over and spend some time there. He hesitated for a moment, before saying that it would be interesting, but first I need to get permission from management.

> I ask [a service worker doing testing] if I can come and have a look, he looks questioningly at Mathias (foreman), who nods and says that it will be OK.

> I ask [leading worker] whether he has time to sit down for a 45-minute interview today, he asks the foreman who says that it's OK.

Whether it was access to a certain area, looking at a specific work operation, or scheduling an interview, all these decisions were deferred to the foreman by the workers themselves, and by the leading worker, checking if he can sit down for an interview with me. However, one might argue that these examples are not only motivated by hierarchy, but rather are examples of the fear of showing me something I shouldn't see, such as industrial secrets. After all, my presence in production was not part of the everyday practice, but rather something unusual, which might have prompted employees to seek clarification from management due to insecurity. This

was probably part of the explanation for the workers checking in with management when I wanted to go somewhere or accompany them in some task. Further excerpts from my field diary, however, illustrate how deferring to superiors was integral to the daily practice of work:

> Most of the employees are present in the break room. The first coffee break is over since the time is now 0900. Trygve spots Mikkel the foreman in the production hall, and immediately makes a move to get up and start working again. The break ends and most people go back out into the production hall.

The mere presence of the foreman in production prompts the workers to end their break and take up work again, not wanting to be seen extending the break beyond the stipulated time. The example illustrates how the schedule is internalized by Trygve, who starts working when he sees the foreman, not because the foreman tells him to go back to work. So while the visible presence of the foreman spurs Trygve and the others to go back, they still do so on their own initiative. Another example shows how access to space was regulated by management.

> Mathias tells Ole that he got a stern talking-to from the warehouse because someone has entered it without permission. Ole explains that it cannot be his fault because he always clarifies with the warehouse foreman before entering.

Space at Safe is regulated, and breaking these rules has consequences. Access to areas is granted by management, and access without permission sparks a quarrel between the foremen, where Mathias is accused of not controlling "his" workers. Thus, the role of management extends beyond ensuring conversion of labor power into actual labor, it also serves to regulate space in the factory, by deciding who can go where, at which time. The most common type of interaction during observation, however, was the direct coordination of work by managers, often down to a rather detailed level. This excerpt from my field diary was typical and provides an example of the form of simple control that functioned to allocate tasks:

> Mads tells Oddvar that the red [product] has to be packed.

On its own, this seems like an example of Mads using his authority as manager to get Oddvar to perform a specific task. Understanding it in its proper context, however, will show that this is also a question of knowledge and the manager's role as a conduit for knowledge – in this case, knowledge of what needs to be done. Mads the leading worker has knowledge of what needs to be done because he has been at the morning meeting to agree on a plan for the day. As a worker in production, Oddvar has not attended this meeting and is dependent on Mads to tell him what to do when he has no obvious tasks on which to work. Management, then, not only have the authority to tell people what to do, but also have almost exclusive access to the knowledge of what needs to be done. Instead of being ubiquitous on the shop floor, knowledge of what needed to be done belonged to the domain of managers. The coordination of work therefore rested on the managers being present in production. The managers were formally tasked with coordinating work in the organizational chart, but at the same time this was legitimized in practice as the managers had privileged knowledge of what needed to be done. The locus of authority (Whitley 1977), the legitimate source of control, lies with the manager, due to his access to the knowledge necessary to coordinate work. The meetings in which work coordination is discussed are not attended by workers, and they are therefore rendered incapable of coordinating production. Instead, information seemed to be divulged on a "need-to-know basis":

> Me: So the workers do not participate in the [morning] meetings?
>
> Mads: No, because if there is something there they need to know, we inform them.
>
> Me: Right, so you have to implement whatever is decided at the meeting?
>
> Mads: Yes.

So, Mads telling Oddvar what to do is not a singular event but a regular pattern of interactions between leading workers and workers, structured by the flow of knowledge surrounding production.

With the branching out into a new market (see previous chapter), the amount of troubleshooting in production increased, and with it the amount of knowledge having to go through the managers.

> Me: You mentioned earlier that production flowed better before. Did that mean you had to make fewer decisions because people knew what to do, or was it the same as now?

> Mads: Weeeell, I would say there is a bit more action [*trøkk*] now than when we had flow, as you say. Then everybody knew what they were supposed to do because we did the same all the time. There is a lot more to do now because of everything that is new. Not that it bothers me or anything, it is just how it is now.

The managers at Safe, from leading workers to foremen, played a decisive role in the practical organizing of production and deciding who did what. But they were not the only source of information guiding work. The other origin of information guiding the labor process was the blueprints coming from the engineers at Technical. Hence, the conception of products took place at Technical, while the execution took place in the two production halls. The blueprints, however, did not provide a detailed instruction on how tasks should be executed. This was to a large degree left to the discretion of the workers. The allocation of tasks was done by the leading workers and foremen. Hence, in practice the authority of the foreman played a significant role in the coordination of production.

The Failure of Bureaucratic Control

The walls in Final Assembly bore testament to earlier attempts at making procedures to govern production, with yellowed sheets of paper detailing how various operations should be performed. I later came to understand that these sheets hailed from the previous attempt to make the production process comply with principles of Lean manufacturing, a goal that had been temporarily abandoned. Thus, attempts had been made at Safe to go from the simple control of the manager instructing the worker, towards formal rules regulating production. During the period of fieldwork at Safe, I had recently finished fieldwork at Metal Industries and was fascinated by the way

written procedures governed the labor process. But already during my first day in production at Safe, I realized that procedures did not play the same role at Safe as it had in the production of aluminum. I learned this while accompanying Odin at his job in the laser cutter control room:

> Odin: We don't have procedures here. There is no correct way to perform a task apart from what the blueprint tells you.

Odin was busy plotting cut lines on a screen, while comparing the job to making gingerbread men for Christmas:

"It is all about fitting as many as you can on one sheet of metal, simple really." I asked Odin again about the procedures, and if there really were no procedures regulating his job, prompting the following response: I am not sure, but you've sparked my curiosity. Let's try to find out.

After some looking around on his computer, Odin managed to find some procedures for how the laser cutter should be operated. It turned out they were quite general. Their main function was specifying how the cutter should be operated in accordance with EHS rules, stating that the operator should familiarize him or herself with the relevant instruction manuals. But there was no specific information on how to do the job efficiently, or guidance for troubleshooting. Such matters seemed to depend on the experience of the particular worker operating the cutter, illustrating how the execution of the task came down to Odin's experience and ideas of what was the best way to go about it.

Other workers were aware of the procedures regulating their job, but chose to disregard them in order to perform tasks in a more efficient manner.

> Oliver: Yes, I do have a procedure I'm supposed to follow, but I have a smarter way to get [description of task] done. The procedure, I only follow if the CEO happens to come by. [Detailed explanation of how he reverses the order of an

operation to save time, contrary to what the procedure says[32]]. Steve Jobs once said that lazy people drive the world forward, because they come up with easier ways of doing things. I think he is right in that.

According to Oliver, the procedures were not relevant for performing the task, nor did it play a part in his daily work. Instead, it was something to bring out when the CEO came by. Later, I talked to Mathias the foreman in order to understand how this discrepancy between the procedures and the actual work looked from the managerial side of things.

> Mathias: We tried having descriptions of the [labor] processes, but it didn't work. I wrote procedures for the whole operation [the manufacture of a product], but they were outdated as soon as a new product came with new specifications. It is the blueprint from Technical that guides how the [products] are made. The procedure for one [product] won't be right for the next one.

Thus, it was the unit and small-batch character of production that made procedures less relevant. Instead of the procedures, it was the blueprints together with experience and managerial coordination that governed the labor process. As the products differed from batch to batch, it was no use trying to make standardized procedures. Hence, bureaucratic control was not seen as a feasible way to control the labor process at Safe. Mons, the executive overseeing production, and also Mathias's boss, explained in more detail how the production differed from standardized manufacturing or the process industry:

> Me: What I'm trying to understand is what makes the organization of production different, autonomous teams [in process industry], more hierarchical here?

> Mons: Well, you know…what I think…Where you don't have repetition and a large degree of standardization, you are dependent on the people doing the different tasks to make it work. And they depend more on continuous communication and information than you would in another type of industry, such as processing. So that's what we must keep in mind at all times here in Storesand. If we compare with our other production facilities, over there it's like:

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[32] Details left out, both for readability and anonymity's sake.

"This is what we are going to do, now we begin. This is process step 1, 2, then 3 and then 4 and it is go go[33]." But here in Storesand it is more like "wow, this was a new type of [product], do we have all the blueprints we need? Do we have the necessary parts, how do we solve this?". At all times you need the flow working, you need the right people in place, and you continuously need to check whether what you are doing is correct. So you have a lot more interaction, right. It is never: "Here you go, make this" "No problem, I made 1000 of those last week" and then you push a button. It is not like that here, you know.

The unit and small-batch character of production was understood to make standardized procedures superfluous at Safe. As the products were not standardized, in the sense of being the same, procedures could not standardize the labor process. Instead, continuous communication and interaction was necessary to keep "the flow working". This communication and interaction was, as shown earlier, the responsibility of the managers. They were not only responsible for coordinating production, but also for balancing the various demands from customers, project leaders and executives by translating it into concrete tasks to be apportioned among the workers.

The lack of procedures meant coordination of tasks was done by the managers. The low degree of standardization of tasks also meant that the Lean-inspired practice of *continuous improvement* was made difficult as there were no standardized procedures to continually improve. Hence, the self-rationalization feared by Moldaschl and Weber (p. 28) was not an issue at Safe. The question was not "How do we do this more efficiently?" but rather, as Mons put it above, "How do we solve this?"

Often, managers in production had to sit down with Technical and people responsible for logistics in order to "sort things out". Towards the end of my fieldwork, I was invited to one such meeting, providing a glimpse into the complicated process of figuring out what had to be done. These meetings were essential for the coordination of people and for making sure products were in fact being made according to specifications.

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[33] Lost in translation. Mons says "tut tut tut", literally "honk, honk, honk", to illustrate how people just go ahead and work by themselves without needing further instruction.

These coordination meetings were decisive in getting "the flow working", as Mons put it.

Making Work Flow

One Friday morning Mads and I walked the 100 meters up the hill to the administration offices to participate in a meeting with Eddie the engineer and Lars from Logistics. While the primary topic of the meeting was a specific component that had lately been causing trouble, it soon became evident to me that an important part of the agenda was to coordinate production. In the following I will provide some quotes from the meeting and explain them in order to give a better understanding of how the *production of coordination* happened in practice.

> Terje from Technical: Are you involved with the ISO tags for the products that Mons is asking about all the time?
>
> Lars from Logistics: Sure hope not.
>
> Mads: He mentioned your name and said that this has to be fixed before lunch the last time I spoke with him.

Every product that left Safe Manufacturing complied with several different standards, of which ISO and NORSOK were the most common. To demonstrate the compliance with the standards, the products needed appropriate tags on them. If there were problems with products, such as one lacking the appropriate tag or another part, this could be registered as a deviation by the customer.

> Mads: They [project leader] are on us all the time now, in order to reduce the number of deviations. But no one steps up to the plate and actually does it. We need to ship some parts for some products we have shipped a long time ago.
>
> Terje from Technical opens a spreadsheet on the screen which specifies the number of tags on each product.
>
> Lars from Logistics: How does this correspond with what is registered in the WZ? These doors are supposed to have seven printed tags on them.

They check whether the WZ and Excel spreadsheet correspond.

The WZ was a program used for monitoring manufacturing, but the products were also registered in Excel spreadsheets because the WZ system did not fulfill all Safe's needs for information management regarding the handling of their products. This meant that the WZ and Excel needed to be checked for correspondence every once in a while.

Lars from Logistics: What tag have we forgotten here?

Terje from Technical: The emergency switch, it's supposed to be one on all these [product type].

[Mads updates the WZ, while we watch on the projector]

[They list the various tags that need to be packed for delivery.]

[Mads calls the warehouse and tells them to ship some parts to a customer]

For Terje, who made the blueprints, it was obvious that the emergency switch was the missing component. Lars, on the other hand, did not work directly with production, only with logistics. Thus, moving products along in production and keeping the flow going often came down to talking with different people until you found the one with the right knowledge to locate the error.

Terje from Technical: Is Odin aware of what he has to do? Call him to make sure.

[Lars is tasked with calling Odin]

Lars: The two products we shipped to [customer X] and [customer Y], we have to send some of the remaining boxes and tags in a separate delivery.

[Everyone takes a few minutes to send out e-mails and make phone calls in order to organize the packing and shipping of parts and products]

While these excerpts are just a few minutes of a meeting that took well over an hour, they serve to illustrate the complexities of the coordination of tasks. Meetings such as these played a role in establishing what was to be done, enabling managers to coordinate and direct work, while simultaneously producing the knowledge of what

was to be done. Thus, the managers had the authority to tell the workers what to do, because they knew what to do, and this knowledge was partly produced at meetings such as this one. Earlier, I demonstrated how the authority of the managers were reproduced because they were the conduits of the knowledge necessary to coordinate tasks. This knowledge in turn, was partly produced in meetings like these, where managers from several departments got together to discuss priorities and make plans that in turn enabled to managers to coordinate production. The plans for work meticulously laid out at these meetings could, however, be overturned by an unforeseen event at any time.

Dealing with Unforeseen Events

When work was flowing at Safe, people had enough to do, products moved through production facilities according to plan, and inputs were readily accessible. A constant threat to the state of flow were changes in product specifications, or new demands for quality assurances from customers. While such changes had been part of production at Safe since the 1980s, they increased as a consequence of reorientation, which increased the variety of customers and products. The new demands could lead to changes to the actual product, but often concerned documentation of details or new forms that had to be filled out and sent to the customer. This led to a degree of frustration among workers and managers involved with production. This conversation between Mikkel and Olai is illustrative:

> Mikkel the foreman: The way we are doing it now, we can't continue like that. We have to talk to the guy from [name of customer firm]. We offered them to come here and check the packing of products themselves, but they declined. Instead, they want pictures of each part they say. They only do it to postpone shipment. Is it registered in WZ [computer system]?
>
> Olai: Yes.
>
> Mikkel the foreman: There is a guy from [customer] coming on Monday. Then we have to tell them we can't do it like this. On [name of project] we made a

form for each batch of [products], with no pictures in it. That was way better. We have to start being tougher on customers.

[Olai, Mads and Mathias nodding agreement]

Mikkel the foreman: I am going to tell [guy from documentation] that we need minutes from the meeting with specified time, and what we are going to do with FAT[34]. If not, then at least we have to be paid extra for it.

Packing the products for shipment to customer was a complicated process because several administrative hurdles had to be overcome to fulfill customer's demands for packaging. Several customers had started to demand documentation in the form of photographs for each packed component, meaning that workers had to open up packed components, take photographs, and then repack them. This was considerably more work than doing as they had previously, using a form to sign off that preservation had been done in the agreed way for the whole batch. Mikkel suspected this was a tactic to delay the shipment because the customer didn't need the products right away, based on the logic that the longer the products were kept at Safe Manufacturing's premises, the less expenses the customer would incur in storing them. Keeping the finished products at Safe was a problem because the firm was low on warehouse space for finished products and, as a result, products were piling up in the production facilities, making movement of products around the production hall more troublesome and meaning more products to keep track of, increasing complexity. Unpacking products to take photos would also mean that workers had to be diverted from what they were meant to do in order to work with packing so that the production facilities could be emptied of finished products and components. It complicated the work of coordinating the labor process, sometimes leading to more problems:

Mads the leading worker: I have made a mess, I marked a door [in the software] as finished, when it was actually due for final assembly. I have 31 products to keep track of down here, so my head is spinning.

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[34] Final Acceptance Test, a test where the customer comes to see a demonstration that the product works according to demands, and if it does, it is handed over and the deal is finalized.

Another source of unpredictability for the production planners was delays in deliveries of specific inputs. This happened more often when producing products that were unfamiliar, such as products intended for buildings on land. While the painters in surface treatment had a good grasp of how much industrial paint was need for offshore parts, this changed when some parts were to be painted with other types of paint not typically used in industrial production. The stocks and expected arrival times of such inputs were a common topic at the meetings where production was coordinated.

> Mikkel the foreman: Will there be any stops in Fabrication today?
>
> Mathias the foreman: We are close to a stop, if we don't get more glue today, we have to stop.
>
> [..]
>
> Mathias the foreman: When are you ready to start painting?
>
> Mikkel the foreman: The paint should have been here yesterday. I don't understand what they are doing at the warehouse, it seems like nothing happens whenever [name of warehouse foreman] is gone.

Stops in production would mean that workers basically had nothing to do, in this case because they had to wait for glue used for assembling components. I did not get the chance to investigate whether Mikkel's impression of the warehouse – that nothing happened when the foreman was gone – was correct in this particular instance or not. I have, however, included it here because the formulation succinctly expresses a broader point: the consequences of the simple control practiced at Safe. With workers learning to expect to be told what to do, it should not come as a surprise that "nothing" is done when they are not told what to do. As the responsibility of deciding what is to be done was placed with the managerial hierarchy, figuring out what to do was not the responsibility of the workers. As was illustrated earlier, figuring out what to do was also difficult for the workers, as the knowledge necessary to coordinate production was kept within the managerial hierarchy. This form of interpellation, the experience of being told what to do, stands in contrast with Metal, where figuring out what to do

next was part of the responsibility of the shop-floor workers. Workers at Safe could work for long periods of time without a manager when "the flow was working". However, if some unforeseen event occurred and a manager was not there to figure out what had to be done, the result was often that workers had to wait for instructions. In the NCM, the relative independence of workers in the production process is understood to be conducive to employee-driven innovation (Høyrup et al. 2014). At Safe, there was very little relative independence, at least when it came to the coordination and allocation of tasks. The organization of the labor process thus systematically led to workers experiencing being told what to do, leading to sentiments such as the one held by Otto, whom I talked to while he was busy packing products for shipping:

> I ask him where the products are going to. Otto tells me he has no idea, and explains that he tries to focus only on his part of the job.

Otto does his part of the job and leaves it to the managerial hierarchy to coordinate overall production, not because he is shirking his responsibilities but because focusing on the task at hand *is* his responsibility. Having an overview of what goes on in production is outside his responsibility. This stands in contrast to the responsibilities of operators at Metal.

Workers being paid to do nothing is naturally a problem from the viewpoint of profitability, but at Safe it was particularly problematic as a huge order was due in June (an order significant for the success of *reorientation*). In order to make this deadline, workers had agreed to come in and work a lot of overtime as the extra hours were necessary to complete production in time. Delays in production would thus mean extra hours to work in on top of this. Management constantly tried to make new priorities in order to avoid waiting and downtime, meaning that priorities constantly shifted. This unpredictability was also felt by Odin at the laser cutter:

Odin: I don't have a stock of drawings [that I can continue working on when I finish this batch]. I get them directly from Technical, so if they don't deliver, I have nothing to do. [..]

Me: Do you generally know how each week will be, what you will be doing?

Odin: No no, no one knows what's happening even 2-3 days into the future. Suddenly, some new thing might pop up that has to be dealt with.

That Odin did not have a stock of drawings he could work with if he finished his current job, also held true for other work stations. Parts might be lacking in Fabrication or Final Assembly, or the engineers at Technical might be out of orders from Sales if they finished their current project:

Terje: I don't have any more projects because I have finished a bunch lately. There are still a few [products] left at the one I'm working one now, 50 or so. Not all of them unique, some are just to be scaled down. When I complete that project, I actually don't have anything to do. Egil, however, [nods in direction of another engineer] has a bunch of projects to start on, so he has work for the foreseeable future.

This illustrates another aspect of production at Safe – responsibility for finishing something was not necessarily that of the department, but of an individual. So in this case, Eirik might have had nothing to do, while Egil had his hands full. This was also the case in Final Assembly and Fabrication:

Me: The different tasks, [specific work procedure], is there one way to do it, or does everyone have their own way?

Mads: We all do it the same way, methods are inherited here, even thought there might be small differences from one person to the next, everyone basically does it the same way. Meaning that in theory, you can work a little bit on this [product] and a little bit on that [product], but generally we avoid that, because you are signing off yourself on the quality form afterwards so….

Me: So the ideal is one man per [product]?

Mads: Yes, as far as that is possible.

This meant that coordinating production was not only a question of coordinating different departments such as Technical or Fabrication, it was also a question of coordinating individuals, since there might be different processes going on simultaneously inside every department. Lack of inputs or new demands from customers, however, were not the only factors that complicated coordination, nor were they the most critical: that was when the blueprint could not be converted to a finished product, and had to be sent back to Technical.

Problem-Solving

As discussed in the theory chapter, discretion to solve problems is held to be an important aspect of the Norwegian cooperative model. At Safe, problems with figuring out how to assemble products often arose, especially when making products for the first time. This necessitated direct communication between the shop floor and Technical. But this communication still went through the managers:

> Ommund the welder explains that if he has a problem with the welding, or something doesn't seem right in the drawing, he contacts the foreman, and then the foreman contacts Technical, then the information comes back to him through the foreman.

Problem-solving called for the involvement of the managerial hierarchy. When workers needed to get in touch with the engineers at Technical, the leading workers and foreman functioned as gatekeepers, deciding which concerns were important enough to be brought to the attention of the engineers. Information and knowledge needed to travel with a manager to get from production to the engineers and back again, making the managerial level important for problem-solving processes that require interaction between the shop floor and Technical. A consequence of this is that when the need for engineer and worker interaction increases, the need for managers to act as conduits also increases. With the new strategy, the need for collaborative problem-solving

between engineers and workers increased. This was referred to as the "curing of children's diseases[35]". Ole, a sheet metal worker explains:

> Ole: New [products] are all about problem-solving. At the start of every new batch of products, there is always a period with a lot of troubleshooting. It simply is a lot of stuff we need to figure out. [..] But when you have assembled the first ones successfully, it is usually smooth sailing for the rest of the batch.

The blueprint then, did not always have all the answers, but by a process of trial and error workers and engineers could work out the kinks and adjust the blueprints accordingly so the rest of the batch went easier. The strategy of reorientation involved a lot of completely new products, which increased occurrences of "children's diseases", and thus problem-solving involving workers, engineers and managers. This "concurrent production[36]" as one manager described it, was seen as one of the advantages of being located in Storesand by the owners:

> Board member: In Storesand you can develop and manufacture products almost simultaneously. You don't need to make a prototype first, you start producing for the customer right away.

Mons the production executive also stressed the need to troubleshoot everything during manufacture of new products, even though this impeded the flow of production:

> Mons: I tell them to stop if they have doubts regarding the blueprint. "Do not trust the blueprint if you have a hunch that it won't work", I say. If you are unsure how to interpret the blueprint, stop. And they have become good at doing that, and when they stop, we need to sit down with the engineers to check whether this is correct or not. We always need to ask ourselves, is this in accordance with standards, do we need to rework [redraw] this, what do we

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[35] Direct translation of Norwegian phrase.
[36] A reference to "concurrent engineering", or simultaneous engineering. A way of doing production where different stages happen at the same time. Design and testing of prototypes, for example, as opposed to first designing, and then testing. The goal is to shorten the time it takes for the final product to reach the market.

have to do to maintain quality? It is hard creating flow under these circumstances.

The "curing of children's diseases", then, provided a feedback loop from the workers tasked with execution to the engineers tasked with conception. Hence, Safe was not an example of a firm striving for the complete separation of conception and execution for which Braverman (1974) criticized Taylorism. Still, the influence of the shop-floor workers on the conception of products – by discussing with engineers – involved going through the managers, who would decide whether the issue called for involving the engineers.

The people closer to production, however, were not too enthusiastic about increased problem-solving in production:

> Mads the leading worker: We would rather they do the product development part before manufacturing.
>
> Me: Right. So earlier, when you talked about how it is not ideal to do product development in Final Assembly, what is that about?
>
> Mads: Well you know when the [product] comes to us, it is usually nearly done. We are only to mount a few parts and then pack for shipping. But then it might be that it does not work as it should, and we have to make adjustments, make holes and cut and other things. So there might be scratches to the surface. Then you need another round of surface treatment after we are done, right? That means we have to do the job two times, and we are not too keen on that, to say the least. We want the products out of here as fast as possible.

Problem-solving in production, then, was an important part of work at Safe and became even more common with the strategy of reorientation, since there were more new products being made and thus more problems to solve that workers had not encountered before. In addition, the contracts signed with customers in the new market were seen as strategically important. That is, it was important for Safe to fulfill these contracts in such a way that their standing in the new market increased. Fulfilling contracts on new products increased troubleshooting in production (the curing of

children's diseases), which increased the need for managers to act as links between Technical and the shop floor.

The Flexibility of Simple Control

Coordination and control at Safe Manufacturing was executed by the managerial hierarchy. Problem-solving, the allocation of tasks, and communication across sections of the factory all involved the structure of leading workers and foremen in some way or another. This was understood to be a logical consequence of the nature of production. Often priorities would have to be changed quickly, or tasks re-scheduled. This flexibility was a part of how people in the firm understood their work, and was also a source of pride:

> Mathias the foreman: Yes, the people here are very flexible. If Mons [production executive] tells me that we are going to bake bread tomorrow, then I will be able to make it so. [chuckles]

The organization of the labor process at Safe differs from what one would expect after reading literature on the Norwegian cooperative model, where autonomous teams, discrete leadership and discretionary problem-solving for workers are argued to be important ingredients of competitive advantage. At Safe it is the coordination by managers that enables the organization to adjust to rapidly changing circumstances. The locus of authority was firmly placed with the managers. They were formally tasked with coordinating and overseeing work, but they also had the knowledge necessary for coordinating production, to which workers for the most part would not have the same access. This played an important part in making the formal authority of the organization chart into a practical and naturalized responsibility on the shop floor. The answer to the question of "What is to be done?" would be worked out in morning meetings between the foreman and the leading workers and in coordination meetings between managers and other departments. In addition, as communication between different sections of production was to go through the bureaucracy, it was also here the information of what was going on in production would flow. The daily interaction

between managers and workers on the shop floor was therefore important in reproducing the authority of the manager over the worker.

Their role as conduits for knowledge flow as well as the coordination of production meant that managers were important to the labor process at Safe. In the view of Oddvar the industrial painter, things would get critical very quickly if the key managers were to exit Safe.

> Field diary: Oddvar tells me that he feels sorry for Odin, who has way too much to do. [..] He explains that Mathias, Mads and Michael are critical to keeping production going. They are managers but know the production process first-hand. If they leave, Oddvar believes things will fall apart rather quickly.

The organization of production developed at Safe long before the strategy of reorientation was invented. But reorientation increased the frequency of occurrences to which hierarchy was seen as the solution to. Dealing with new customers that behaved in unpredictable ways and increased problem-solving in production both increased the need for coordination. Thus, it seems likely that reorientation would strengthen the need for managerial control and coordination of the labor process at Safe.

Labor Process at Safe Manufacturing and the Norwegian Cooperative Model

NCM prescribes delegation of responsibility to workers in the labor process because it increases efficiency. This reconstruction of Safe's labor process from fieldnotes and interviews presents Safe's labor process as an anomaly to the tenets of the NCM. Instead of delegation of responsibility to workers, the responsibility for coordination lay with managers, both in the formal positions they had in the organizational chart of foremen and leading workers, but also reproduced in practice by their access to the information of what was to be done. While the labor process did not entail a complete separation of conception and execution, even the solving of problems on the shop floor by worker-engineer interaction involved the managers as middlemen. Mons the manager explained this organization of work in the uniqueness of the products, with

each new product demanding troubleshooting as well as "continuous interaction and information". Hence, the organization of work at Safe was grounded in actors' understanding of the challenges posed by production. The need for flexibility, rapid changes in priorities, and uniqueness of the products all posed problems to which the managerial hierarchy and simple control was understood as a solution. This understanding was not limited to managers themselves, but also echoed on the shop floor, as Oddvar expressed before. The locus of authority, the source of control to which workers are willing to submit (Whitley 1977), lay in the managerial hierarchy. At Safe it was not the formal rules of the procedures that governed production, but a combination of the embodied knowledge of the workers, directed by the managers. This differs from the central tenets of the NCM, which argues that delegation of responsibility is both efficient and preferrable from a quality of work point of view. Safe also differed, as we shall see, from the way the labor process was organized at Metal Industries in Lillevik.

Making Metal

The strategy of cost-cutting had consequences for how the labor process was organized at Metal Industries. There was a strong link between the idea that cutting costs was necessary, and a specific form of organization: Lean manufacturing. In the Lillevikian interpretation of Lean, a core principle was that operators took responsibility for production and participated in continuous improvement. Marius, a former manager at Metal and central to the implementation of Lean, explained the essence this way:

> Marius: I quickly realized [during implementation in the 1990s] that this was going to be a hell of a job. This was not work for engineers, this was a question of managing people. We were going to turn a large organization on its head, to get the operators to take on a lot more responsibility [..] actually, we were going to do what the LO [Norwegian Confederation of Trade Unions] had wanted for many years: giving more authority and duties to employees [..].

A central organizational change was to give more responsibility to regular workers, the operators on the shop floor. In Marius's view, this involved getting the local trade union to do what the national leadership in the LO had been arguing for a long time – decentralizing authority to workers. But the introduction of Lean at Metal Industries was not the beginning of participation and co-determination at the smelter. These ideas went back to the 1970s, when the first steps were taken to change the way production was being organized. Martin, a manager central to this process in the 1970s and 1980s, ascribes the change in management philosophy to a visionary CEO:

> Me: Where did these ideas come from?
>
> Martin: Back in the 1960s it became clear to us that a metal smelter is a harsh working environment. A lot of smoke, noise and gases, simply unhealthy. Over time, that wears down the will to do a good job, so this was wearing down the organization. [..] The equipment was also worn down, and the employees were frustrated that Metal did not re-invest in new equipment. [..]They felt that the values they created were being invested elsewhere, and not to improve production here. Especially in electrolysis, where conditions were so extreme, there was a lot of frustration. So our experience was, from the late 1960s, that we had to do something about the working environment. And the source of these new ideas, the vision of these new cooperation projects, that was the CEO at the time. He was a unique leader, and he had vision, not only for the next few years, but for decades. And he was the first person at Metal to really consider the working environment and the need for a softer style of leadership.

Ideas about "softer" leadership and cooperation between management and operators would find their expression during the 1970s and 1980s, when several experimental projects were undertaken, where the goal was to increase the participation of operators in decision-making. In the beginning, the goal of these projects was deemed "co-influence", but over time the goal changed to the stronger concept of "codetermination". The results of these projects proved so successful that ideas of codetermination would spread to the entire smelter. From the late 1980s, however, a change in leadership and a crisis in the aluminum market relegated ideas of codetermination to the background for a decade. But from the mid-1990s, they

returned, but now as a part of the philosophy of Lean manufacturing. The "softer" style of leadership Martin talks about is related to the ideas of the industrial democracy experiments of the 1960s and 1970s, where the empowerment of workers was seen as both a benefit in itself, but also as beneficial for efficiency. The stories of Marius and Martin point towards the resonance of what would become tenets of the NCM at Metal – The ideas of increased worker responsibility from the experiments in industrial democracy, and the later intertwining of these ideas with the ideas of Lean.

The central organizational reform in implementing Lean at Metal Industries was the removal of several layers of managers. Most visible on the shop floor was the removal of the foreman from the team. Before, a foreman had been the leader of each team, working day, afternoon, and night shifts alongside operators. After the removal of the foreman, the idea was that the team should lead itself in deciding who does what and when. The foreman on the teams was replaced by a team leader working from an office during daytime, with the responsibility of following up on three different teams. Thus, the new team leader did not play any hands-on role in production. This new organizational form, bearing the name *autonomous teams*, had consequences beyond saving money on managerial wages: it led to a transition from bureaucratic control to what Barker calls concertive control (1993), a shift in the locus of authority from that of the foreman to the norms of the team itself:

> Ole the operator: Before there were a lot of managers. Shift foremen, hall foremen and so on. They told us what to do. So you usually just sat down and relaxed until someone told you to do something. We did what was necessary of course [to keep metal flowing], but everything to do with maintenance and such was not done unless the foreman came and told you to do it. Now we do everything ourselves.

Here, Ole describes the change from a combination of technical control (we did what was necessary) and the simple control of the foreman telling them to perform maintenance tasks (Edwards 1994), to concertive control – the internalization of responsibility for maintenance. I will shortly demonstrate how this new form of control

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placed the responsibility for production with the teams of operators and as a consequence made the question of conversion into one to be handled among workers rather than between management and workers.

Even though the foreman was removed from any hands-on role in production, most operators still preferred working afternoon or night shifts. While some explicitly stated that this was preferable because there were no team leaders or engineers, there was also a general sense that work flowed better during afternoons and nights:

> Oddny: You get into a steady rhythm, get into the flow, and produce a lot of metal. During day shifts there is a lot of maintenance on the equipment, which means that there is a lot of waiting, and meetings as well. It is boring to not have anything to do.

At the same time, these types of statements were often qualified by adding that not all operators were like this – "Some just sit with their smartphone" as Ottar, a batch coordinating operator, put it. During analysis I would come to understand the norms regulating the effort of the team, and that a dichotomy between lazy and industrious workers was a cornerstone in how work was understood on the shop floor.

Stories about who was an industrious worker [*en gjæving*[37]] and who was a lazy worker [*latkuk*[38]] were shared frequently during overlaps and in breaks on the shift. A number of different qualities characterized an industrious worker. It was especially important to leave the work station or machine in good order, so that the next person could start working right away and not have do maintenance first. The state of the casting hall was a frequent topic during overlaps, as well as who had left work for the next shift and why they might have done this. If they had been having trouble with machinery or other equipment, leaving boring work [*dritarbeid*[39]] for the next shift could be within the rules of good conduct. But if the shift had been having a quiet day, for example due

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[37] Someone who "makes themselves useful", not afraid to work hard, tries their best, make an honest attempt.
[38] Literally, "lazy dick". Someone who would rather do nothing than do something useful.
[39] Literally, "shit work".

to maintenance, and still left boring work for the next shift, this was seen as a violation of good conduct. On B-shift, which I accompanied, these stories were often told by Oscar, an operator and machine driver I soon understood was seen as a hard worker. Ove, another worker on B-shift who was seen as more of a lazy worker, never told such stories. In fact, the team's social sanctioning of Ove became a key to understanding what norms regulated the work effort of the autonomous team.

Changing Gasket

During my very first day at Metal Industries I was invited to join the machine driver Ove in a loader, used to fill up the casting ovens with liquid metal. While part of me felt like a kid accompanying the grown-ups to work, the ride in the loader and its aftermath would prove pivotal in understanding the regulation of work effort.

> Ottar: Do you see that loader?
>
> Me: Yes?
>
> Ottar [looking at me eagerly]: Do you want to go for a ride in that loader?
>
> Me: Erm, yes?
>
> Ottar [calls up driver on radio]: Ove, I have a guy down here who wants to come up to you in the loader and see what it's like.
>
> Ove [on radio]: Yes, just send him up.
>
> Ottar: Here he comes, now you just climb up that ladder and join Ove up there.

Ove welcomed me into the loader cabin, where he patiently explained to me what being a machine driver was about while continuing to fill ovens with metal. This was done with a tool mounted on the loader consisting of a lid with a pipe in it. This tool is used to pick up barrels (containers able to hold liquid metal), push the lid down on them, and create pressure by adding air so that metal can be pumped out of the barrel. This is essential when pouring metal from the barrel into the oven where the alloys are made. For the barrel to be sealed with the lid on, the gasket on the lid has to be relatively new, as they are worn down over time. At the end of Ove's run with the

loading truck, he explained to me that we had to change the gasket. Ove left the old gasket on the ground and explained that we had to wait before putting in a new one, as the lid was still too hot from carrying metal in the barrel. After this we went back to the control room, which also functions as the break room for the operators, and the shift ended without the new gasket being put in. At the time I didn't think any more about this, it was just Ove showing me another routine task being done. Interaction involving Ove, however, would capture my attention as soon as the following day, when he was reprimanded by Ottar:

> Ottar: Ove, you have to go out and work.
>
> Ove: That's not my problem.
>
> Ottar: Yes it is, because if you don't, the barrels get cold, they can't stay [on the holding shelf] for 6-7 hours. That's not very good.
>
> Ove: Is that my problem?
>
> Ottar: If you don't do it I will report[40] you.
>
> [Ove goes to the truck to start filling ovens.]

The problem with metal staying on the holding shelf for several hours is that the temperature drops, making it harder to reach the desired temperature when loading it into the casting ovens. At the time, I had a sense that this might be an example of an internal hierarchy within the team, where Ottar as batch coordinator was the de facto leader of the supposedly leaderless team. However, I would later come to understand this interaction in a new light, as grounded in norms for how one should behave on the shift to be considered a good worker, and what made Ottar's reprimand possible was the common understanding on the team that Ove did not live up to these expectations. While Ottar was seen as a hard worker and respected for his knowledge about making metal, he was young and in no position to act as an informal leader of the team. This

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[40] Reporting here implies writing a deviation report, signaling to management that work was being done in deviation of the procedures describing how tasks should be performed.

became clear to me after noticing how Ottar would be rather quiet during overlaps and when a lot of workers were assembled in the control room and the older and more assertive workers dominated the conversations held on a group level.

Industrious Workers and Lazy Workers

Writing a report against a member of one's own team is not common at Metal, and in most cases might be frowned upon by fellow operators. Operators would prefer to take up problems directly with other operators rather than drawing management attention to such issues. This excerpt from fieldnotes is from a conversation in the control room when Ove is not present.

> Ole-Petter: Other shifts have complained to Frank [team leader] about him. It has been red on the same place every Monday. There was trouble with pipes [on the barrel tool] yesterday and yesterday he had pulled the gasket off the lid, but hadn't bothered to put in a new one.

> Oscar: It doesn't look good when you take over [a work station] after him. I've let Marko [team leader] know by writing a deviation report. "Are you writing deviations on your own shift?" he asked me. "I don't know who has done it", I answered [But we all know it is Ove, my interpretation].

Here we see that one of the operators has tried to sanction Ove by filing a report for deviations from procedure. From Frank the team leader's response, we also gather that this is not the behavior expected from operators. The norm that one does not file reports for deviations on one's own shift is so explicit that even the team leader reacts to Ole-Petter's breaching of it. Ole-Petter however, has not added Ove's name in the report and thus tries to limit his breaching of inter-operator etiquette.

Most of the time the sanctioning of Ove was kept within the shift and viewed by the rest of the team as something to sort out by themselves. Work performance, then, was very much a question for Ove's fellow operators, and not just a matter between him and management. During my stay with the team, the construction of a case against Ove by fellow operators continued by pointing out instances when he failed to live up to expectations:

Ole-Petter: Now the fool went to eat. He has to empty the two barrels waiting there [which are filled with liquid metal, slowly cooling down, eventually risking solidifying and a lot of trouble].

Olivia: Can't you do it Jonas?

Ottar: When it is calm in the morning, it is usually hell [a lot to do] at the end of the day. That's just how it is.

Later, this episode was revisited by Ove in conversation with the operator Anne in the control room, about eating at work in general:

Ove: I ate at 0830, breakfast. Jonas asked why I hadn't filled the oven. But I didn't know that there was any [liquid] metal. It turned out there was, but he [Jonas] hadn't informed me.

Oddny: Ah, OK sure.

[silence in break room]

There are two important takeaways from these excerpts. The first is the consequence of Ove not emptying the barrels; that Ole-Petter or someone else on the team has to do it instead. This created additional work for them, in addition to the work they had already planned to do. The other point to note is that Ove himself is aware of the fact that this was not entirely all right, and feels a need to explain his actions by stating that he didn't know that there was metal to be poured into the oven at the time. My interpretation of Oddny's response is that she does not completely buy into this explanation, and her tepid response is not only for Ove, but also meant for another audience – the other operators in the room – who saw this episode in connection with their other "grievances" against him regarding work performance. It was, in a way, too late to remedy himself in their eyes only by making excuses.

With this understanding of the norms regulating work established, Ottar's reprimand of Ove can be seen in a new light: Ottar was able to threaten Ove with reporting him to management without fear of negative reactions from fellow operators because Ove was generally regarded as a lazy worker. In a way, Ove was similar to an outlaw: he

could be sanctioned by other workers with means that would otherwise be violations of team norms, such as threatening to report someone to the team leader. While a series of events seemed to have led to the "outlawing" of Ove, one transgression was the failure to "prepare the oven". Oscar, one of Ove's fellow operators, explained to me how "preparing the oven" was part of the natural order of things:

> Oscar: Once I have prepared the oven for casting, I immediately go and prepare the next [oven]. I do it right away, and after, I can take a break. That is the way to do it in order to keep up with the schedule. Some people, they just go and sit down as soon as an oven is ready, then they wait as long as they can before they prepare the next one, so it's ready just before the deadline. If something unexpected happens, they might fall behind [schedule]. The procedures don't say anything about this, but people get these kinds of things, it's completely normal. It's like you behave at home too; you finish the job before you rest.

When leaving a work station it should be left in such a state that the next operator would not need to prepare it: "Leave it in the state you want to find it", as operators often put it. And the state they wanted to find it in was such that they could start producing metal right away. Oscar himself was one of the operators playing a part in sustaining these ideas and putting in an effort to make everyone "get it" by initiating and taking part in conversations about preparing in the overlaps between shifts.

A common topic among operators during overlap was who had not prepared, who would get angry if it was not prepared, or why one had not prepared. What needed to be said during overlap was not that one had prepared, as this was taken for granted. Rather, instances of not having prepared needed an explanation. Not preparing for a specific operator could also be a way of sanctioning operators who were seen as lazy. In such cases, it was often discussed among operators and the person who hadn't prepared could argue their case.

> Field diary: During talk about who works hard and who hardly works, Mats tells about how he tries to force another operator to do his part: "I just leave him a lot of barrels [that needs cleaning], it is the only way to get him to clean at all."

> Oscar explains why he won't bother making ready for another operator: "I won't prepare for Patrik, he never prepares for me," before going on to list people he won't prepare for, as they are lazy.

We can now better understand Ottar's threat of reporting Ove to management. As Ove is seen as a lazy worker, Ottar deems that the threat of making a report is within what is considered reasonable behavior. This would be especially important for Ottar, as he is held in high regard by management for his skill, in spite of his young age, and might be headed for higher-level jobs in the future. This did not seem to be a problem for fellow operators, as they often acknowledged that he was indeed good at his job. They frequently made friendly jokes about how he was headed for "office work" in the future and that it already had gotten into his head.

Had Ottar been threatening fellow operators with management on a general basis, he would have risked being seen as someone who was sucking up to management and been the target of social sanctions. What the threats of sanctions and stories about who prepares during overlaps illustrate is how the responsibility for the productive effort of the team is not that of a foreman or manager, but that of the team. Should conflicts arise over such questions, they are now along a horizontal axis, between team members, rather than along a vertical axis, between management and team. Instead of Ove's unfinished job with the gasket being an issue between him and a foreman, it is an issue between him and his fellow operators. Thus, after the removal of the foreman, ensuring that labor power was converted into actual labor was enforced by the operators themselves.

This seem to be the opposite of what Sverre Lysgaard described in his work on the *worker collectivity* (2011). The system of norms that made up the worker collectivity protected the workers from the insatiable demands of the technical-rational system. At Metal, the opposite seems to be the case; the norm system on the shift is aligned with the company's goal of converting labor power into actual labor, and those not pulling their weight risk being sanctioned. The norm system at Metal, instead of protecting the workers from the insatiable demand for labor of the technical rational

system, ensures they work hard. The locus of authority has moved from the managers to the norms reproduced by the workers themselves, and this has brought about a situation where workers discipline themselves. In Lysgaard's terminology, this would be an example of the technical-rational system infiltrating the worker collectivity by getting the workers to identify with the goals of the company rather than the interests of the worker collectivity. Responsibility for production and the conversion of labor power was not the only aspect of the autonomous teams. The delegation of authority also contributed to an experience on the part of operators of being listened to.

The Joy of Being Right

The most dramatic event during my time at Metal occurred while I was accompanying the operators in one of the casting huts, overseeing the casting of liquid metal into large slabs. Before being poured into the casting pit, the aluminum goes through several filters. On this particular day there was a lot of trouble with one of the filters: a heating device inside the filter was not working, meaning that there was a risk metal might solidify inside the filter. From inside the casting hut, we watched the temperature of the metal inside the filter drop steadily, while tensions among operators, engineers, and managers increased. Suddenly the lid of the filter launched into the air in a hail of sparks before crashing back down to the ground.

> Technician: Wow, did you see that!?

> The power of the filter has dropped to zero, an alarm is ringing. Ole picks up the phone and tells someone in a stern voice to "send all the electricians you got, right now".

This really accentuates the problem with aluminum in the filter solidifying, and a brainstorming between operators and engineers ensued. They discussed various solutions for keeping the temperature above the solidifying point and in the end they followed Oddgeir the operator's idea for solving the problem instead of Erik the engineer's idea. Later, when the problem seemed to have been solved and the actual

casting of the metal was starting, a larger than usual audience follows the start of the casting from the hut.

> Oddgeir: I was right!
>
> Erik the engineer searches his phone for a table of alloy smelting temperatures to argue his case, mutters "This was difficult to find."
>
> Ole: See, here you have the correct diagram.
>
> Oddgeir: And it is 679 degrees, exactly like I said! [Turning to me] Write that down in your book, the operator was right.
>
> Ole: If this slab turns into shit I'll kill myself.
>
> Erik the engineer: Ok, you were right, but we will still do as I say!
>
> Ole: Can you fix the [specific technical task] afterwards Erik?
>
> Erik: No.
>
> Ole: [pretending to be angry] You cannot do a simple [technical task], what the hell are you even doing here?

When the casting went according to plan, the tense atmosphere dissolved into friendly banter between the operators and engineer present. There is also an underlying satisfaction on the side of the operators for being right and seeing their experience-based knowledge prevail over the formal education of Erik the engineer. This episode is an illustration of a common occurrence at Metal, namely that of operators being seen as the most knowledgeable in practical questions in production. The direct communication between operators and engineers differs from Safe, where managers acted as gatekeepers between the shop floor and the engineers. Towards the end of my stay at Metal I discussed my research project with Ole Petter, an operator who had become an important informant:

> Ole Petter: No matter which way you look at it, I think the main reason things work well here is because operators are listened to.

While some disagreed with Ole Petter's description of things, the majority of operators I spoke with echoed Ole Petter's sentiment. Operators were not only listened to, they were also seen as knowledgeable of what was happening in production. Ole Petter echoes the central tenet of the NCM: the idea that job quality and efficiency are intimately connected. Things work well because operators are listened to. During a break, the manager in charge of casting operations had joined the operators for a coffee in the control room:

> Ove: Why do we even need to go to the morning meetings when we can see all the necessary info on the screens anyway?

> Manager: It is to provide us managers with info on what is going on, so that we can support you and coordinate better.

Operators, then, were seen by management as knowledgeable of production, and prided themselves on being able to come up with better solutions to problems than the engineers. Operators saw the making of metal as their responsibility, but also as something in which they were experts. This must be understood as a consequence of the way production was organized, with the team leader not being hands on, while operators had responsibility for the process. This necessarily leads to a rapid growth of experience-based knowledge on the part of operators. Another part of this was the ubiquity of information in the production areas: screens in control rooms provided everyone with the information necessary to make decisions regarding production, which is what prompted Ove's question about the morning meetings – they already have all the information they need on the screens, so why do they have to go to a meeting and interact with management? This is in contrast to the flow of information at Safe, where managers' command of information naturalized their role as decision-makers. At Metal, the opposite seemed to be the case; instead of getting the information to the managers, formal decision-making authority was shifted onto the operators. Operators, in turn, were able to coordinate tasks and the flow of aluminum because they had access to the relevant information for making decisions, to such an

extent that Ove wondered why they should interact with managers at all in the morning meetings.

Evaluating Engineers and Managers

The dichotomy between industrious and lazy workers among operators was closely tied to their performance on the shift. Engineers and managers were also evaluated by workers in a similar way. An industrious engineer was one who was hands-on in production, while a lazy engineer was one who only stayed in his office. Odd, an older operator with over 30 years of experience, explained:

> Before, in the old days, the engineers would sit at the office in jeans and a shirt. But when Mark Olsen [a former CEO] came along, he told them to get the hell out of the offices, put on overalls and take part in production.

> Field diary: Odd is clearly happy about this turn of events, that the engineers had to get their hands dirty in production. Operators Oline and Otto nods in agreement and add something to the effect of "That's how it should be".

Odd contrasts his version of the past with the present in order to justify the way it is now. Rather than wishing to be left alone by engineers, operators valued their presence in production. During an interview, Oddgeir the operator touched upon the same point when talking about management:

> Yes, we do have some contact with management, like the one I talked to before, he is actually an engineer, but he is not so much out here in production. Evgeni [another engineer], on the other hand, participates a lot with us out here. He is a trainee [engineer]. But really, he is industrious, he helps us.

Evgeni, then, is only a trainee, not a seasoned engineer, but is still seen as the best one by Oddgeir, as Evgeni is constantly out in the production halls interacting with operators. To be in production and know the art of producing metal is a good thing. Otto used the team leaders' lack of participation in production as justification for his dislike of them:

Otto: They think too highly of themselves to take part in production and get their hands dirty, that's why they have to be in their office all day.

It is no surprise to me at this point that Otto is not too fond of management, as he had voiced his negative views of team leaders in particular on numerous occasions. What is interesting here is that he uses their distance from production as the reason for his criticism. Odd, on the other hand, is positively surprised when he sees how the "office people" are still able to play their part in production. The context of this exchange is a shift in which the operators are low on manpower. This excerpt from the morning meeting sets the tone:

Oda: [after the roles and jobs for the day have been discussed] With this set-up, it is only me and Oline at the fire-hauling [an operation that requires several operators and moving equipment with the crane]. Do you really think that is an OK way to do things [it would be an obvious breach of EHS rules]?

Mats the manager: We think it is OK because we will help you.

Oda: OK, then it's all good.

The managers (here designating the people working in offices during daytime) are aware of the manpower shortage and will assist with the fire-hauling when it is due. This inspires Odd to perform a job observation at this particular fire-hauling. The concept of job-observation comes from the Lean-manufacturing philosophy at Metal, where operators should do one job-observation a month to get their bonus. This consists of observing someone perform a job and checking that it is done according to procedure.

Odd: I decided to do a job-observation because the staff (management) was taking part in the fire-hauling. But that went well. You know they have all been operators at some point themselves, and they hadn't forgotten their job.

Thus, when he sensed that the managers and staff would participate in the fire-haul, Odd seized the opportunity to reveal the incompetence of the managers in the tasks

of production – but the managers hadn't lost their touch, and the fire-hauling was performed according to procedure, which Odd acknowledged.

In this case, the practice of production bridges the gap between the shiftwork operators and daytime managers. The way people relate to production matters for the relations between people. Operators, managers and engineers are all evaluated by operators for their skill and mastery of the tasks involved in the making of metal. Rather than wishing to be left alone by management or engineers in the production halls, operators consistently explained that they preferred them to be visible and participate in the making of metal.

Through interaction such as the cooperation on the fire-hauling evaluated by Odd, the potential arose for identification between operators on the one side, and managers and engineers on the other. The ability to be an industrious worker is not limited solely to operators but has the potential to form a "we" that exists across the divide between engineers and operators. A "we" built on the basis of industriousness instead of the more common dichotomy between daytime staff and shift workers. This, in turn, could make operators more sympathetic to demands from managers or engineers, but also the latter group more sympathetic to the demands of operators. The "we" built on identifications of each other as industrious personnel (operator, engineer, manager) was thus an alternative to the "we" built around the differences between the "daytime people" (staff and managers) and shiftwork operators. Whichever was highlighted was a question of context. This identification in relation to skill and effort in hands-on production resembles what Egil Skorstad found when he visited Lysgaard's paper mill in the 1980s (Karlsson et al. 2015): the increasing say of workers, combined with differentiation between those who mastered the more advanced tasks that came with technological development, created conditions for new identities formed across the former demarcation line between workers and managers, and thus weakening the conditions for a strong worker collectivity that could resist management. The idea being that when there are fewer conflicts between management and workers, other

forms of identification might become more important, such as identification over the quality and skill of work, which Karlsson designates the *technical system* (Ibid.). The interaction between operators and engineers at Metal allowed for processes of *identification* and *interpretation* to take place between them. Odd's job observation above also shows how managers could be included in such processes when participating in operator tasks such as the fire-haul. Hence, common interpretations between operators, engineers and managers were possible on the grounds of Karlsson's technical system.

In Joan Woodward's classic *Industrial Organization* (1965), she finds that process-industry firms are characterized by an inner ring consisting of the personnel working directly with handling the process. She goes on to argue that the organization of production does not have to provide a mechanism for the coordination of work because within the inner ring, the plant itself provides a framework of discipline, control and coordination (Ibid.). In Metal's case, this statement takes it too far as the change in organization at Metal clearly shows that the framework provided by the physical plant and the process still needs to be interpreted by actors in order to know which way to control and coordinate the process. Still, the flow of aluminum at Metal, the process inside the inner ring, had a forceful logic of its own: The necessity to avoid solidified metal at all costs. This set some definite parameters for the handling of work as well as the timing of tasks. Operators could follow the progress of the process on screens in control/break rooms, and information about the current stages was ubiquitous. Thus, while the liquid metal in itself did not coordinate work, it posed a number of absolute challenges that had to be dealt with if the metal was to be kept flowing. And these absolute challenges provided the labor process with a degree of predictability. Being accepted into the community of operators populating this imaginary inner ring was a question of how one performed one's job.

Becoming One of the Lads

The question of industrious or lazy workers was not limited to bridging the gap between the roles of operator, engineer and manager. It was also intertwined with gender and ideas about masculinity and femininity. Oda, an operator in her 40s, explained:

> I worked at M-shift until 2014, and there they talked about how some people worked like an old woman [*kjærring*]. But I was never accused of that, because "Oda [*ho Oda*], she works like a man" [they would say]. So these boys, they had this tone, there was a competition between them, who was quick [to finish a task], who was slow, who did the job properly and these things. But I was never among those who were seen as working like an old woman.
>
> Me: You were a woman doing men's work?
>
> Oda: Yes, I was one of the boys. When I was on N-shift here in 2011-12, one of the old timers gave me a pat on the back and said, "Oda, you are one of the lads [*en av gutta*]." That is the biggest compliment I have ever gotten in my time here.

Working hard then, could make you into one of the boys. Hence, notions of masculinity were intertwined into the dichotomy of industrious and lazy worker. Interestingly enough, taking on the extra responsibility of being the union representative on the shift would not help in this regard:

> Me: I am curious as to why there are so many female union representatives on the shifts, or there are at least as many as the female proportion of the labor force. I would think it was the other way around, harder for a woman to be elected representative in such a male dominated environment?
>
> Oda: But being representative is not a man's job. It is too much talk and meetings, and meetings are boring.
>
> Me: But isn't it a leading role in the collective?
>
> Oda: Yes, but I am not sure the boys see it that way. They want to show up for work, do their job, drink some coffee, work some more, and then go home. [..] They want peace and order. When there is a problem, everyone steps up to the

plate, that is OK. And then they think the rest of us, the representatives, should see to that everything is OK with the firm and that we get a good wage and so forth.

Thus, meetings and talk were not necessarily a part of being one of the boys at Metal. Note how this fits well with what was discussed earlier, that it is participating in production that makes an employee into one of the boys. Production, however, was not the only thing connected with being part of the community of operators. Language and tone also mattered. The context for the following exchange is the control room where operators gather when there is nothing to do. Here, small talk and friendly banter is the order of the day. Omar is a former refugee from Eastern Africa who has settled in Lillevik with his family. He has a permanent position at Metal, and has worked on this shift for well over a year. Nowadays he mostly works daytime because his wife is taking evening classes to become a nurse. Ole is an old timer in the anode bakery, a big burly man who is often loud and direct.

> Ole: Erm, Omar, what kind of courses is she taking, your wife?
>
> Omar: What? Do you mean the wifey[41] [*kjærringa*]?
>
> Ole: [smiling], yes yes, the wifey [*kjærringa*]! What is she doing?
>
> Omar: [Explains the nature of the course]

What is going on in this exchange is that Ole is making an effort to start a conversation with Omar during a break. He is afraid to cause offence and uses the Norwegian word "kone" [wife] instead of what he would normally use in this situation, "kjærringa" [wifey]. Omar on the other hand, rejects the (politically correct) term *wife*, instead showing Ole that he is indeed one of the boys, and ask Ole if he means *the wifey*. This functions like a mirror for Ole, showing him that he in fact used a "nicer" word than he would normally use when he asked about Omar's wife, implying that Omar is someone

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[41] Some of the nuances are lost in translation here, but the English "wifey" seems to come quite close.

for whom one needs to adjust one's language when speaking. This is rejected by Omar, who insists on being an equal, able to use the same language as Ole. Participation in production, then, as well participation in control-room chatter, served to integrate the team into a group with a common sense of identity. As we saw earlier with the engineers and managers, skillful handling of production tasks could narrow the gap between different occupations such as the operators, engineers and managers. In this environment, where white men formed the large majority, women or immigrants could become one of the lads by conforming to the standards of work established by the norms on the teams. However, the labor process at Metal was not always characterized by operator, manager, and engineer interaction and identification on the grounds of the technical system. Managers perceived by operators to step out of their role and breach norms could rapidly bring the demarcation line between managers and operators to the fore.

Resistance

At Metal, procedures regulate how tasks are done down to a quite detailed level. However, operators might sometimes deviate from procedures in order to save time, or because they think that there is actually a better way to do things than the procedure says. Managers are not oblivious to this, and might even encourage it in order to reach production targets. This can be met by resistance from operators. The prelude to this exchange is that I ask Oline, who is a temp, why she hasn't gotten regular employment by now. From there, the operators start to talk amongst themselves about who gets called in when they need a substitute, and how important favoritism [*trynefaktor*] is. (Usually it is the operators themselves who call in substitutes when needed, so the favoritism is with other shifts, not necessarily the managers, although in this particular case management had overtaken the responsibility from the shift because there were too few people and needed support). Oline is an operator in her early 20s of small stature while Ole (from the conversation with Omar) is a burly guy in his mid-60s.

Oline: I don't care what management thinks of me. They asked me if I could drive the crane for the whole shift [operators are only supposed to work in the crane for four hours at a time due to the level of concentration required]. I said over my dead body [*aldri i verden*]. Then they laughed at me and tried to pressure me into saying yes.

Ole: Who?!

Oline: Mons and Marko [managers]. But driving the crane for an entire shift is a really dangerous thing to do. I won't be a party to it. It is really dangerous for the people on the floor if I drive the crane and am not focused. The maintenance people can be hit by something.

Ola: (agitated) It is good that you let them know Oline! You have to stand up to them. You are tough enough to do it. It is very good that you have resisted them. If you don't speak up [*si fra*], they just continue. Mons is completely out of line [after he was promoted from operator to manager]. He should try that stuff with me, then I would really have let him know! You are tough to let them know.

Oline: Yes, if I just do as they say it hides the fact that we are short on people [on this shift].

Me: So there is a tension between productivity and EHS?

Ola: Yes, it is, really. Like this rule about us not moving outputs by the sides of the factory hall. When we are behind the schedule they (management) turn a blind eye to it and hint that it is OK.

Odd holds his hand to his face and looks through his fingers.

Oline: They really pressured me, I considered going to the union.

Odd: Yes, they would have let them know!

Me: So you go to the union [with these types of problems]?

Odd: We don't even have to go to the union, if we say NO it is enough.

This conversation invokes a multitude of norms and practices common on the shop floor at Metal, and thus needs some unpacking to make sense. On a general level, however, it is an example of operators working out a common understanding of a

problem: Mons is completely out of line. Starting with the concept of the shortcut, we can see how Oline talks about resisting management's attempt to deviate from procedures in order to increase production. As an isolated incident, this would seem like a clear violation of safety rules. However, at times there were deviations from procedures for practical reasons in order to keep the flow of production going. This leads to the question of why this particular violation of conduct engenders such resistance on Oline's part and unequivocal support from her fellow operators. One answer could be that driving the crane for eight instead of four hours is just seen as too dangerous. Another explanation could be that the particular team leader, Mons, is disliked by operators, as Ole alludes to when he states that Mons is completely out of line. While these explanations might all be relevant aspects of the situation, this episode can be understood on a deeper level when interpreted in light of the fact that the locus of authority resides in the autonomous teams.

When Mons the manager tries to coax Oline into operating the crane for longer than EHS rules would allow, he is not only asking her to disregard safety procedures; at the same time he is challenging the authority of the team to coordinate tasks in production. The operators react to this because in their eyes the decision about when and how to take shortcuts is theirs – it belongs to their world and is not something that managers should meddle in. Mons the manager, for his part, is a former operator and has been part of the world where shortcuts are common and, since it is a practice he is familiar with, might not see why he cannot ask operators to take shortcuts. While operators sanction team members and take shortcuts for the sake of productivity, they do so on their own initiative. The process of designating Ove as a lazy worker, and the threat of reporting him to management that comes with it, is a social process orchestrated on and by the shift. Likewise, the shortcuts are taken on the initiative of the operators, who try to avoid management finding out about them. In their roles as managers, Mons and Marko are venturing into operator territory: they are stepping out of bounds. Oline resists this and goes to her co-workers to find support, which is forthcoming. Here, the roles of managers and operators, rather than the industrious-lazy dichotomy, become

the significant identity. The us and them in this case are the operators on shiftwork and the daytime managers. This suggests that a worker collectivity type of resistance to the "insatiable demands of the technical-rational system" might show itself when operators experience threats to their authority.

On my question about going to the trade union, Odd states that it is not necessary as they themselves are capable of standing up to management. This also provides a clue as to how operators see themselves. In her work on masculinity among industrial workers at the coke works in Mo i Rana, Norway, in the 1950s, 60s and 70s, Hilde Gunn Slottemo found that honor was central to the identity of the male workers (2003). This honor was linked to notions of the workers being equal to the office workers. In Slottemo's work, this explains why the attempt of radical students[42] to infiltrate the trade union at the coke works failed: not only due to political disagreements, but because the worldview propagated by the radical students described the workers as oppressed and subordinate to the bosses, thus challenging the workers' view of themselves as being on an equal footing with the bosses. Understood in this light, Odd's insistence that it isn't necessary to go to the union becomes another expression of the operators' view of themselves as having the authority to decide what is safest and best for production, and the power to make it so. They do not even need the help of the union: the operators are capable of standing up to management on their own. That the team is able to solve its own problems is thus linked to the operators' understanding of themselves as being responsible for solving problems of production themselves.

This illustrates that the processes of identification and interpretation taking place were context-dependent. In situations where their authority was threatened, the worker collectivity – the "us" as shift workers – would come to the fore. At other times, the industriousness might be the ground on which to construct a "we". This is paralleled in

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[42] The Norwegian Maoist party AKP (ML) encouraged members to enter working-class jobs in order to make the party into more of a working-class party than being composed of radical students.

Karlsson et al.'s (2015) findings from Lysgaard's paper mill, where the collectivity was strong in the 1950s, almost invisible in the cooperative period in the 1980s, and resurfaced during the period of tougher conflicts in the 2000s.

Autonomous Teams and Competitive Advantage

Earlier I demonstrated how the process character of aluminum production posed some absolute challenges to the labor process. The temperature at which aluminum solidifies meant that there were absolute limits to how long a barrel of liquid aluminum could stay on the holding shelf, for example. While there certainly were a large number of unforeseen challenges that could arise at any moment (as in the case with the short-circuiting filter on p. 135), a good part of the labor process was also quite predictable. Certain problems would have to be solved over and over again. This predictability allowed for the making of a detailed framework of procedures to regulate the labor process. Each working station, machine or task would have a procedure that described the task and how to do it in great detail.

Procedures at Metal, then, entailed a standardization of tasks in the language of the procedures. These in turn were informed by considerations for EHS and for efficiency. These rules were there to be followed, and deviations from these rules were to be reported on. Thus, the autonomy of the team was not an autonomy to solve tasks as they saw fit. Rather, it was a freedom to make decisions within a closely regulated framework in which the goal was to produce aluminum as cost-efficiently and safely as possible.

The autonomy of the team was thus a bounded autonomy in which the procedures delineated the space within which operators were autonomous to solve problems. As long as the processes necessary to make aluminum went as planned and procedures were followed, decisions regarding practical matters were left to the teams. This was the case during afternoon and night shifts, weekends and holidays. The operators would run production, while a few engineers and managers would be on call, reachable by phone if there were any unforeseen events. The labor process at Metal was

governed by rules, but within these rules the teams of operators were left a relative degree of freedom to make decisions.

A fruitful way to understand the way the procedures and the autonomous teams frame the labor process is to think of the procedures as delineating a space within which the operators are free to make decisions as they see fit. Operators are not autonomous in that they can do as they want, or produce aluminum as they want, but in the sense that they should interpret what is going on and solve problems in accordance with the procedures. The rationale for doing this at Metal was that it was thought to produce better and more efficient decision-making. Instead of having to convey knowledge of the production process to managers or foremen, and wait for them to make decisions, the authority to decide was shifted to where the hands-on knowledge of production was found: among the operators on the teams. The motivation for this on the part of management was better decisions which were made more efficiently. The senior executives at Metal were staunch believers in the efficiency of the autonomous team form of organization and argued that its contribution to competitive advantage was obvious:

> Me: But still, this [the operators governing themselves] must be hard to measure in money terms?

> Senior Executive: Well, directly yes, but we do have productivity targets, so we can see it on parameters such as tons produced per operator, which has increased a lot since the 1980s. I think [...] we also can see it in reaction times, if we compare ourselves to other smelters, we solve problems much faster than many others. If there are problems in our daily operations, they don't last as long as other places, and that is because those that are closest to the processes [operators] react quickly. They don't wait for the engineer to come and tell them how to solve a problem.

The autonomous teams were understood to make daily operations and problem-solving more efficient. In addition, the detailed procedures had another role, namely to ensure the quality of the aluminum alloys upon which Metal competed in the market.

Autonomous teams at Metal were thus understood to have clear advantages when it came to creating competitive advantage, as defined by the strategy of cost-cutting.

The Experience of Working on an Autonomous Team

The freedom (within bounds) to make decisions also involved a particular experience of the employment relationship: the experience of having a say in matters of production. Participating in decision-making and making decisions on the shop floor thus calls for being a particular type of operator. To be an operator is to take a certain degree of responsibility for production. If not, one risks sanction by the team, as was demonstrated earlier with the sanctioning of Ove, and with Oda's story of using gender stereotypes to regulate the work effort. The organization of work at Metal thus interpellated subjects in a different way than at Safe Manufacturing. At the latter, the central experience was one of being told what to do. At Metal Industries, the central experience was one of allocating tasks and structuring the work day on the team of operators. At Safe, taking responsibility for production was not seen as part of the role of shop-floor worker, while at Metal, this responsibility was a central part of being interpellated as an operator, even to the extent that challenges to the autonomy of the team might be met with resistance. This responsibility for production was understood by executives as an important part of Metal's competitive advantage. Hence, on Metal's shop floor it would seem that influence over work on the part of operators did indeed trigger the human resources needed by the firms, as Thorsrud has argued (see p. 25). The standardization of tasks in procedures played an integral part in this because it enabled the delineation of a space within which operators were delegated responsibility for coordinating tasks. The procedures also provided an object onto which workers knowledge could be mobilized to improve efficiency in the labor process. This point will be further explored in the coming chapter.

The Labor Process at Metal

Contrary to the organization of work at Safe, Metal's labor process was organized along the lines prescribed by the NCM, with autonomous teams delegated a degree of

responsibility for production. Both among executives and on the shop floor, this was seen as key to Metal's success (further explored in chapter seven). The delegation of responsibility to the teams, along with the removal of foremen, led to the development of norms between operators and the transfer of the locus of authority from the managers to the teams themselves. The teams' norm system designated production as the responsibility of operators, and also made conversion of labor into labor power a horizontal (worker-worker) rather than vertical (worker-manager) question.

The norm system contributed toward making participation in the practical tasks of aluminum production important for processes of identification, at times enabling the formation of a "we" on the grounds of the technical (quality) system (Karlsson et al. 2015). Depending on their participation in practical tasks in the production halls, operators, managers and engineers could be part of this "we". If the authority of workers was seen as threatened, however, the demarcation line between "us shift-work operators" and the "daytime people" could quickly come to the fore.

Becoming an operator at Metal thus involved subjecting oneself to the formal and informal rules regulating conduct, and being qualified to take responsibility for production. Hence, the organization of work at Metal interpellated operators in a different way than the workers at Safe. Rather than minding their own business, operators at Metal were expected to take responsibility for production. Following Burawoy's notion that production of things is also production of people, Safe and Metal not only produced different things – they also produced different experiences of the labor process and different types of workers.

Conclusion: A Tale of Two Labor Processes

Informed by literature on the Norwegian cooperative model, I started fieldwork expecting to find two labor processes that were organized in a similar way. But, as this chapter has demonstrated, I encountered two different ways of organizing work: at Safe, the simple control of the managerial hierarchy where managers coordinated production by allocating tasks to workers, who were left a degree of freedom in

execution; at Metal, meanwhile, autonomous teams were delegated a degree of responsibility for coordinating production and task allocation, while procedures regulated the execution of tasks, creating a concertive form of control where norms on the teams regulated operator behavior, turning the question of conversion into a question handled between workers rather than between workers and managers. At Safe the locus of authority lay with the managers, being tasked with coordinating production in the formal organizational chart. In practice, this authority was reproduced by the managers' exclusive access to the information necessary to coordinate production. Workers expected to be instructed what do to, but also lacked access to information of what needed to be done. At Metal, the locus of authority was with the teams of operators, who were delegated and took responsibility for coordinating production and allocating tasks. Hence, at Metal, the labor process adhered more closely than Safe to the tenets of the NCM of delegating responsibility to workers. The execution of tasks at Metal, however, was formalized in procedures. These procedures, however, could be influenced by operators through continuous improvement, an important part of the "Lillevikian understanding of Lean." Thus, it is possible to understand the labor process at Metal as both an example of the autonomy prescribed by the NCM, as well as an example of the *democratic Taylorism* described by Adler (1995). This illustrates Olsen's point of the intertwinement of managerial trends with the "existing configuration of working life in Norway."

Among executives at Safe, both former and current, the hierarchical control of production was understood as a solution to the challenges posed by the production of custom-made safety products, which differed from batch to batch. The new strategy of reorientation strengthened these tendencies, and increases in unforeseen events and problem-solving called for even more coordination and control by managers. At Metal, the organization in teams and responsibility of operators were seen as relevant solutions to the challenges posed by the need to cut costs to stay competitive. The standardization of tasks delineated a space within which operators were given responsibility for production. The autonomy of the NCM were seen as relevant to the

challenges faced by Metal, while at Safe production was understood to pose challenges that pointed in the opposite direction, utilizing simple control to ensure flexibility in production.

The different ways of organizing work interpellated workers and operators in different ways, or rather, being a worker at Safe and an operator at Metal involved two different experiences of working life: being instructed in what to do at Safe, while taking responsibility for production at Metal. This chapter has contributed pieces to the puzzle of the research question by demonstrating how the labor process differs between the firms, and the understandings of production in which the organization of work is grounded. It has also introduced a crucial piece of the puzzle by arguing that the different labor processes interpellate different industrial subjects, a point that will be drawn upon in the coming chapter on labor-cost mitigation by arguing that responsibility for problem-solving enables mobilization of operator knowledge for employee-driven innovation. As the subjectivities formed in the labor process constitute the political terrain upon which industrial relations take place, the description of interpellation will also be crucial for the analysis in chapter seven.

Chapter 6: Mitigating Labor Costs

"A slow sort of country!" said the Queen. "Now, here, you see, it takes all the running you can do, to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!" Through the Looking Glass, Lewis Carroll (1991, 14).

For firms involved in capitalist competition, it takes all the running one can do to keep in the same place. The imperative to accumulate, or running, takes different forms in different contexts. A central notion in the literature on the NCM is cooperation for firm development. The previous chapters have focused on strategy and the labor process, both of which can be said to belong to firm development. Another central challenge for Norwegian firms, however, is the relatively high cost of labor (Ravn 2012). This chapter will investigate how firms seek to mitigate labor cost, understanding the price and productivity of labor as a central aspect of *firm development*. At Safe Manufacturing the use of temporary workers was seen as an important part of keeping fixed costs down, and I will draw on Vidal and Tigges concept of *systematic numerical flexibility* (2013) in my discussion of the role of temporary workers. At Metal, automation and robotization was seen as the way to reduce labor costs. This chapter will ground the analysis of these two instances of *firm development* in the previous chapters to show how systematic numerical flexibility and robotization were connected to understandings of strategy and the challenges posed by production.

In addition to the use of temporary workers and robotization, this chapter will explore how employees' knowledge was mobilized for development of the firm by drawing on the concept of *employee-driven innovation* (Sørensen et al. 2014). I will demonstrate how the different strategies and organizations of work at Safe and Metal had consequences for how worker knowledge could be mobilized. While EDI is held to be a central part of the advantages of the NCM by Levin et al. (2012), this chapter will demonstrate that at Safe, the knowledge held by workers was not mobilized in a systematic way for efficiency. At Metal, however, the Lean-inspired practice of continuous improvement was seen as integral to the strategy of cost-cutting. This

chapter thus contributes to answering the research question by exploring the particularities of labor-cost mitigation, and thus firm development, at Safe and Metal. The NCM stresses the advantages of cooperation for such development. Before exploring the potential advantages of cooperation, however, it is necessary to grasp what firm development entails in the view of local actors, and that is the focus of the following chapter.

Safe Manufacturing: Systematic Numerical Flexibility

The workload at Safe varied with the amount of contracts they were producing for at any given time. At times there was little to do, while at other times workers had to work overtime to fulfill contracts by deadline. The need for labor fluctuated with the success Safe had in bids for tenders. Traditionally, this had been solved by industrial firms in Storesand by using each other's workers according to needs, so that workers in firms with little to do were hired by firms with a lot to do. In addition to this, Safe also hired temporary labor from other Nordic countries in a systematic way.

> Michael the former executive: We used temporary workers in the 1980s, welders from [Nordic country], and had good experiences doing it. They were cheap and industrious, really industrious. Work-time regulations were in the way though. [..]

While the systematic use of temporary labor had become a permanent feature of the labor process at Safe, the workers' origins changed with the expansion of the EU-labor market in 2004 and 2007[43], from the Nordic countries to Eastern Europe. Michael himself had initiated the hiring of workers from Eastern Europe, but underlined that this had nothing to do with paying less in wages than the levels established by Norwegian collective agreements:

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[43] In 2004 and 2007 there were two rounds of expansion of EU members which led to several Eastern Europeans becoming members. Liberalization of labor mobility, together with the economic crisis in 2007 and 2008, made Norway into an important destination for migrant labor from Eastern Europe (See FAFO report 2016, 2 by Jon Horgen Friberg for an overview)

> We did everything by the book, no social dumping or such. That makes things more expensive of course, but we depend on them for our total capacity. They are interested in working from morning to night, and there is plenty of work. We have been careful to do it in accordance with laws and regulations, so that the trade union have been satisfied. But I have quarreled a lot with trade unionists during my time here…

While a number of temps had gone on to become regular employees at Safe, they still worked to the "temp schedule", meaning that they worked long hours in order to go home for longer periods. The workers who went from temps to permanent employees thus remained migrant workers, going back and forth between Storesand and their country of residence. Hence, effects on the organization of work at Safe resembles what Line Eldring found in Norwegian construction firms: the organizing of production to accommodate the use of temporary labor in a systematic way (Eldring, in Bungum, Forseth and Kvande (eds) 2015).

Motivation for Hiring Temporary Workers

There were two arguments for the hiring of temps at Safe. While managers working in production stressed the need to have qualified labor, and that this was hard to recruit in Storesand, the owners were clear that the need for flexibility was the primary motivation, a need that was strengthened by the new strategy of reorientation.

> Christopher [board member]: We cannot (post oil-crisis) commit ourselves to large fixed costs, so we have formalized cooperation with [Eastern European country] on hiring temporary workers. Temps are for managing hectic periods, but now we have a higher percentage than usual because we have grown. We have to adjust costs, and thus, need to have more volume [in production] before we can hire more regulars. [..]

The formalization mentioned by Christopher was a formal agreement with a staffing agency, here going by the name of *Staffers*, specializing in connecting Eastern Europeans with experience of manufacturing with Norwegian firms. The temps remained employees of Staffers, and were hired by Safe, unless they started in a permanent position at Safe. One obvious advantage of this was that the temporary

workers could be laid off the moment they weren't needed for fulfilling a particular contract. And, as Michael points out above, they have become an integral part of production at Safe, not only because they can fill in the gap in hectic periods, but also because they are industrious and willing to work from "morning to night". Closer to the shop floor, however, there were doubts regarding the use of temporary labor and its long-term effects.

Mikkel the foreman agreed that temps were necessary but explained that the long-term goal was to create a base of young permanent workers living in Storesand. In order to achieve this, Safe had taken steps to start cooperation with the Storesand School for Vocational Training. The problem was the lack of skilled workers in Storesand, which was not a typical industrial town. Olav the leading worker, however, saw the lack of skilled workers as a consequence of low wage levels.

> Olav the leading worker: They hire temps because there aren't enough skilled workers. And that is because the wages are too low. Then that type of education loses its status, and the class for sheet-metal workers at the vocational school doesn't have any students this year [because there were no applicants], even though they have a completely new building and everything.

Thus, both managers and workers acknowledged the lack of competent labor in Storesand. There were several motivations for the hiring of migrant workers as temporary workers at Safe. At the decision-making level, the need to keep fixed costs down was seen as the most important, but managers closer to production emphasized the need for competent people. The use of temporary workers, however, had implications beyond the "total capacity" of Safe Manufacturing or the hiring of competent people.

Compartmentalization of the Labor Force

My time at Safe was divided evenly between the two main production halls, Fabrication and Final Assembly. The former was manned almost exclusively by Eastern Europeans, while the latter almost exclusively by Norwegians. In Fabrication there were two

Norwegians and 10-12 Eastern Europeans, while in Final Assembly, there were two Eastern Europeans and 12 Norwegians. I wasn't able to find out whether this was a coincidence or a result of a conscious effort not to have an all Eastern European and all Norwegian section; nonetheless, this was the consequence. During breaks such as the 0900 coffee or lunchtime, workers would seek out their own group, so that the Eastern Europeans had lunch in one place and the Norwegians in another. During work however, cooperation on tasks were common. Mads, one of the leading workers, lamented the low level of social interaction between the different groups:

> Mats: The temps they take in are foreigners for the most part. That means that we have to speak English, and not everyone [of the Norwegian workers] is able to do that. And some of them [Eastern Europeans] hardly speak any English at all. The result is that you get a lot of unnecessary talk and confusion, and you often have to involve a third party [as an interpreter] to get things done.

> Me: It seems that the Norwegians and Eastern Europeans are two distinct groups?

> Mats: Yes, it is a pity that it is like that. Because when we have social gatherings, we go really well together. We get along, and we sit and talk and everything. But during working hours it is as you say, two groups.

Even though migrant workers and Norwegians at Safe were two distinct groups, relations between them appeared cordial. As discussed in the methodology chapter, I wasn't able to gain much access to the group of migrant workers. The reconstruction here is thus based on how things looked from the Norwegian group. In conversations among the Norwegians regarding the migrant workers, the things that frequently came up was their willingness to work and their proficiency. However, while relations seemed cordial, there still were two groups: migrant workers (temps and regulars) and Norwegians (regulars and two apprentices); one group where an Eastern European language was the working language, and one where Norwegian was the working language, with English being used whenever there was a need for communication between the two.

The degree of unionization was another difference between the two groups of workers. In the group of Norwegians, the majority held union membership, while in the migrant group things were a little more complicated. According to Mats the leading worker, the migrants might be members of a union at Staffers, where they were formally employed.

> Me: What about organizing the Eastern Europeans, how is that going?
>
> Mats: We have let Staffers know that the ones we hire must be organized there. And they claim that they are, but it is difficult to know.
>
> Me: So they are organized at Staffers?
>
> Mats: And that is fine by us [trade union at Safe]. Here the majority have traditionally been organized….I don't care so much anymore unfortunately, I am done with that [being a union activist], but I know that before almost everyone was unionized. Now I think many have pulled out [of the union][44]. But we do have permanently employed Eastern Europeans that are unionized.

Olav the leading worker, a trade union veteran at Safe, was skeptical regarding Staffers' acceptance of trade unionism:

> In 2014, some people were laid off because there wasn't enough work. But right afterwards, they hired temps instead, and most of the temps are afraid of organizing. We had an electrician here before, and we convinced him to join the union. But after he left for [Eastern European country] we never saw him again. When I spoke to him, he said Staffers had told him there was no work for him. But they hired several more temps during that period. I don't think Safe Manufacturing is the main problem here, they want to keep people here to retain the skills, but these things are handled by Staffers. But I always try and get them to organize.

Mathias the foreman also shared the view that out of the migrant workers, few were organized.

> Mathias: There is no demand to be organized here. I know *The United Federation of Trade Unions* [Fellesforbundet] has a core of people among those

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[44] Later, I would come to understand that this was directly related to frustration of how the union was handling the question of temporary workers. This will be discussed in the next chapter.

with regular employment. Among the Eastern Europeans, hardly any are organized.

The Norwegians and the migrants spoke different languages, stayed in different places and differed in their relations to their employers. Most of the migrants were employed by Staffers and were not members of a trade union, at least not the trade union at Safe. The Norwegians for the most part held a permanent position with Safe, with the majority being unionized. In addition to this, they followed different schedules. The migrants worked from 0700 to 1800, with potential overtime on top of that. The Norwegian workers, on the other hand, worked from 0700 to 1500, plus overtime. Therefore, in addition to differences in socializing during breaks, language and degree of unionization, the rhythm of work was also different between the two groups.

In the Norwegian workers' descriptions of the migrant workers, some themes kept recurring. The most common way to describe them was as industrious workers, who worked hard and as much as possible. This would for the most part come across as something to be respected, but at other times, the migrants were talked about as deserving of sympathy:

> Field diary: Otto tells me that the Eastern Europeans are really good at what they do. [Name of migrant worker] comes in and help them from time to time [..] They are going to work the entire Easter, but get to go home afterwards. That will be good for them, to have something to look forward to, he ends, empathically.

Secondly, and connected to the idea that migrant workers were industrious, was the notion that they were not overly concerned with EHS rules, prioritizing getting things done instead. These notes from stories overheard in the Norwegian workers break room give an idea:

> Field diary: Today they are trying to fix a motor in the ventilation system in the painting hall. Since it is close to the ceiling, they need a scaffold. Olaf comes in and jokes that the scaffold they brought isn't tall enough, so they need to sit on each other's shoulders to reach up to the engine. Then Eddie tells a story about

one time he saw the Eastern Europeans build a scaffold in a such a sloppy way that he had to convince them not to use it, as it was really dangerous. "But they will probably help you out", he adds, jokingly. Before telling about a migrant worker who used a ladder from a lift, something which is also against EHS rules and dangerous.

Among the Norwegians, the third widely held idea regarding the Eastern Europeans was that they came from a different and much more hierarchical work culture where the foreman ruled supreme. As Mathias the foreman put it:

Here the foreman is their buddy, they are not used to that.

What is meant by *buddy* here is not necessarily that Mathias is the friend of all the migrant workers, but rather that they can come and talk to him whenever there is a problem, and that he will not reprimand them for small issues. Oddvar, a worker and old timer at Safe, and almost an advisor to management due to his vast knowledge of the products, explained it this way:

A problem with the Eastern Europeans is that when they arrive here, they don't dare to speak up if something is wrong. Where they come from, it is easy to lose your job, you have no protection [against losing your job for no reason]. But when we have experienced Eastern Europeans here it works out OK because they teach the new ones the Norwegian work culture.

Later, I overheard an example of this in a conversation between Mathias and a Norwegian worker, implying that speaking up when there was a problem without fear of reprisal had to be learned by Norwegians with regular employment as well.

Mathias [to Norwegian worker]: We have to find out what the problem is. Not just that there is a problem, but establish the nature of it. It doesn't matter whether the fault is yours or mine, what is important is what it is [that is wrong]. This is what we have to find out.

This is related to what was discussed earlier (chapter five), the curing of "children's diseases" in production. A prerequisite for discovering them is that the workers in production speak up when there is some problem.

Understanding Migrant Industriousness

Norwegians and migrant workers were two distinct groups at Safe Manufacturing, divided by language barriers as well as in space and time. They were also regarded differently by management, with the migrants being seen as the more industrious of the two. Mathias the foreman who was in charge of Fabrication where the migrants worked, often remarked that he was spoiled as a foreman, having such industrious workers. Einar the engineer had been with Safe since the early 1980s, and felt that the migrants had something most Norwegians lacked these days:

> They want to work and keep at it. They are not afraid of working overtime or extra weekends. That kind of work ethic disappeared from Norway 15-20 years ago, in my view. This is just my personal view of course. But still, we have noticed it, the work ethic was stronger before.

Even among the Norwegian workers, the consensus was that the migrants were industrious workers. If disregarding Einar's hypothesis of the disappearing work ethic in Norway, what might be an explanation for this industriousness?

One way to understand the perceived industriousness of the migrant workers at Safe is by relating it to their location in the labor market (Dawson et al. 2018). The migrants at Safe are experienced sheet metal workers, a skill that Safe had a hard time acquiring in Storesand. In addition, wages in Norway were higher than in their home country, making the work at Safe more lucrative compared to their country of origin. There was also the possibility of getting a permanent position at Safe, as several of the migrants had. This would entail better job security, compared to the risk of being dismissed if the foreman at Safe or [staffing agency] was unhappy with effort or skill level. At Safe, there was also the opportunity to work a lot of overtime. Taken together, this helps us understand why going to Storesand and Safe to get a job might be attractive to migrant workers. And in order to keep it, keeping management satisfied was a condition, at least as long as one was employed through the manpower agency. Who could stay and who was dismissed was decided by Mathias the foreman and Maksin the leading worker, who oversaw the migrant section of the workforce.

Field diary: Mathias discussed the newly arrived workers from the manpower agency with Maksin, and whether they are able to do the job satisfactorily. Maksin explains that one of them works well. Then we have to let the other one go, Mathias says. Maksin argues that the real problem is the blueprint. Mathias ends the discussion by saying that "this is how it is; if they can't get it done, we cannot keep them around."

At first glance this is but an ordinary encounter between the leading worker Maksin and Mathias the foreman, but interpreted through the lens of the concept of *migrant work ethic* Dawson et al. 2018), and context of the labor market, it offers a glimpse of the flexibility endowed on managers by the arrangement with the manpower agency. Workers can be brought in, and those who "can't get it done" can be quickly dismissed. Instead of having an interview and hiring a regular worker, Mathias can just bring people in to production and see whether they "can get it done". Thus, while the job at Safe is probably an attractive one, it can easily be lost, either by being let go by the foreman or, as mentioned earlier, by trying to unionize. The place of the migrant workers in the labor market thus seems a fruitful way to understand the "industriousness" of the migrant workers at Safe. Another important aspect of the migrant work ethic at Safe, however, can be brought in by taking into account the sphere of social reproduction (Bhattacharya 2017).

The sphere of social reproduction concerns everything necessary for the reproduction of labor power, including the raising of children. Before fieldwork, this was not something on my agenda, but in analyzing a casual conversation with Mathias the foreman on the practicalities of being a parent in a time-squeeze, I came to understand another aspect of the flexibility of migrant labor.

Field diary: Mathias, talking about the migrant workers, says that he is happy to have such industrious workers at his disposal. He is spoiled he says, with having workers "who do not have to go home." The talking about going home spurs a short conversation between me and Mathias, since we both have children, and have to either deliver or pick up our kids at the kindergarten. I ask him how things would be here if everyone had to pick someone up in the kindergarten or school. He agrees that that would have been close to impossible. We talk a bit

more about the struggle to get everyday planning to come together when having kids, and how it becomes easier as they grow older.

This serves to illustrate a particular quality of migrant workers, namely that they "do not have to go home." They have to go home eventually of course, but leaving for home in Storesand for the migrant workers meant leaving for a rented house shared with a lot of other migrant workers. Going home to the family happened when they went home to their home countries. And it was in order to make these trips as long as possible that the migrants worked long days and overtime. Thus, while in Storesand, the migrant workers at Safe would have close to no family obligations, being willing and able to work when Mathias needed them to. This is another difference between Norwegian workers living in Storesand and migrant workers living in Eastern Europe. The former has other obligations, which at times might take precedence over work, such as getting kids to school or kindergarten. Mathias, for example, would arrive at the office later because he had to take his kids to school. The families of the migrant workers, on the other hand, could count on no such help and would have to sort things out for themselves. Nancy Fraser has criticized how capitalism freerides on caregiving and other activities that maintain social bonds, while it ascribes them no monetary value and "treats them as if they were free" (Fraser, in Bhattacharya 2017: 23). In the case of the migrant workforce at Safe, however, they practically are free since the migrant workers are removed from all their social obligations outside of work.

The position of migrant workers in the labor market, combined with the distance to their family and other social obligations, thus provides Safe with a flexible work force with an interest in working as much as possible. In other words, the use of migrant workers at Safe, even if paying wages in accordance with collective agreements, provided a flexible workforce that fit perfectly with the strategy of reorientation, which entailed large spikes in labor needs when important contracts had to be fulfilled. In addition, bringing in new workers was made possible by the simple control in the labor process, where workers were being told what to do. This allowed for new workers to

immediately start working; as long as they knew the relevant skills, their supervisor would take care of task coordination.

Employee-Driven Innovation

Employee-Driven Innovation (EDI), the mobilization of worker knowledge for value, is said to be typical of the Norwegian cooperative model, or the model itself is understood as a form of EDI (See Levin et al. 2012). When I first arrived at Safe, my research interest lay in understanding how the Norwegian cooperative model worked at the level of the shop floor. This model is often understood as a form of *employee-driven innovation* (EDI) (Levin et al. 2012). A concept emphasizing the mobilization of worker's knowledge for increased value creation (See Sørensen et al. 2014 for an overview). When selecting cases, I believed Safe would be a typical example of a firm focusing on EDI: In an interview, the CEO had talked about how they had decided to stay in Storesand because they were afraid to lose local know-how if they moved production abroad. In addition, the trade union at Safe was quite active and there were several instances of industrial action, also in periods with lower oil prices. This led me to believe that this was a trade union aware of the importance of workers' knowledge for the company, which was ready to put force behind its demands from a position of strength. The situation at Safe, however, turned out to be the opposite. Rather than a strong trade union convinced of the value of their experience-based knowledge, I found a relatively weak union (see next chapter) and only isolated instances of EDI. In fact, the systematic mobilization of workers' knowledge for value creation was not a priority at Safe. This episode, reconstructed from field notes, is instructive in how EDI was treated on the shop floor:

> Otto shows me a device which helps compress insulation in order to get it inside a frame. Before, they had to use a hammer to drive it into place. This was hard work, and gave Otto tendonitis. But the guy at the carpentry workshop came up with this solution, where one can use a hand-crank to compress it so it fits without hammering. It saves time, it avoids tendonitis, and there is less metal dust inside the finished product.

Otto went on to explain to me that the bonus they could get from coming up with good suggestions was important. If there was no bonus, why would anyone bother, he asked rhetorically. Mikkel the manager and Ole-Johan were walking by, and seeing that Otto was showing me the compressing device, contributed some comments in passing:

Ole-Johan: This saves the whole company from bankruptcy!

Mikkel: This comes from the farthest corners of Pinchcliffe Valley[45].

Ole-Johan overemphasizes the importance of the device in order to underline that it is in fact not that important at all. Mikkel compares it to the quirky inventions from Pinchcliffe Valley, implying that this is not part of some systematic practice, but rather an expression of the ingenuity of the man in the carpentry workshop, a quirky genius rather than the systematic knowledge mobilization of Lean's *continuous improvement.* Thus, EDI takes place, but is not a systematic practice on the shop floor. Instead, it is a coincidental occurrence, growing out of workers' ingenious solutions to practical problems.

The lack of focus on EDI at Safe stood in sharp contrast to Metal, where operators' knowledge was seen as crucial for the strategy of cost-cutting. Its low priority at Safe should be understood in light of the senior executives' and owners' understanding of the challenges of production. As Christopher the Equipriv board member explained: "the critical knowledge for Safe is that of the engineers at Technical." Hence, in the view of the authors of the strategy of reorientation (senior executives and owners), the engineers' knowledge of safety standards was Safe's critical knowledge, not the know-how embodied in shop-floor workers. This is not to say that know-how was not important, and executives did emphasize the advantages of worker knowledge in

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[45] *Pinchcliffe Grand Prix* [*Flåklypa Grand Prix*] is the most-viewed Norwegian film of all time, telling the story of the quirky inventor Theodore Rimspoke [Reodor Felgen] and his companions. Theodore's workshop is located far away from other people, and the film draws on imagery of rural Norway to tell the story. Theodore Rimspoke is portrayed romantically as a quirky, creative, inventor genius.

"concurrent production (p.122)", but the critical asset in terms of knowledge at Safe was located at Technical.

Furthermore, there was no standardization of tasks at Safe. Instead, knowledge of how tasks should be performed was embodied in workers, who solved tasks as they saw fit, disregarding procedures. Hence, while knowledge of tasks was *externalized* in conversations among workers on how to best execute certain tasks, they were not *standardized* in procedures. A consequence of this was that there was no object that workers' know-how could be brought to bear upon. At Metal, operators saw continuous improvement of standardized tasks as part of their job. At Safe, as tasks were not standardized, improving them systematically became difficult. The lack of standardization in procedures, as we have seen (Chapter five: *The failure of bureaucratic control*), was a result of the custom-made nature of the products, making procedures outdated as soon as one batch was completed.

Systematic Numerical Flexibility and Retaining Know-How

To solve problems during production, "the curing of children's diseases" was seen as an integral part of Safe's competitive advantage by management. Being dependent on temporary workers who learned the tricks of the trade, and were then dismissed when there was less work, seemed to undermine the processes of skill formation and establishing a culture where people spoke their mind, both prerequisites for the curing of children's diseases in production. How was this puzzle solved at Safe?

One solution was to try to get temporary workers who had been at Safe before to come back when more labor was needed. Mathias the foreman was in charge of most of the temps at Safe. Or rather, he was the foreman, and had a leading worker from Eastern Europe named Maksim under him. Maksim had started out as a temp but now had regular employment and had been a leading worker for many years. With a good command of both English and [Eastern European language], he functioned as a translator between the migrant workers and Mathias. While Mathias wished for everyone to be able to communicate in English, this was not the case among the

workers under Maksim. This made Maksim vital for the functioning of the group of migrant workers, and hence for the flow of production at Safe. In spite of the challenge of the embodied knowledge of migrant workers leaving when they were dismissed, Mathias the foreman had no wish to deviate from the approach of *systematic numerical flexibility*:

> Mathias: Using temporary workers is clearly a challenge when it comes to the knowledge and skill [related to our specific products]. So I try not to change too many people. Out of the temps, the one we have had for the longest has been here since 2014.

> Me: You don't want to hire them yourself and take them over from the agency?

> Mathias: We have a very good deal with [staffing agency] so we usually don't do that. But we had one guy who wished to move here and get a regular job, so we made an agreement to hire him.

> [..]

> Me: But does this mean that when they leave you lose the skills they build up here?

> Mathias: Absolutely, we do. But we wish to get them back again, and at times they go home for longer periods, then come back here.

> Me: Does that affect the way you allot tasks?

> Mathias: Yes, with critical stuff I use our people, always on things we are vulnerable on [having only a few competent people]. Temps are just a bonus for putting in hours.

Hence, the advantages of being able to scale the number of workers up and down with demand outweighed the problem of losing embodied know-how. Thus, for Mathias and Safe, the best-case scenario was to have a pool of temps with experience from Safe to draw on when needed. This illustrates how the use of temporary workers had become an integral part of how things were done at Safe. The organization of work at Safe thus very much resembled what Line Eldring found among construction

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companies in Norway: that the organization was adapted to accommodate the systematic use of migrant labor (Eldring, in Bungum, Forseth and Kvande (eds) 2015).

Reducing the Cost of Labor at Safe

For executives at Safe the main way to limit labor cost was to have the right capacity at the right time, increasing the workforce in hectic times, and reducing it in slower periods. The importance of a few strategic contracts in the new market (see chapter four) meant that having enough labor at the right time took precedence over measures that could have increased the productivity of labor. Furthermore, the custom nature of products complicated the standardization of tasks, which made continuous improvement less feasible. In addition, mobilizing worker know-how to make incremental improvements in the labor process was difficult because the tasks in the labor process changed between products and batches of products. The primary way to mitigate labor costs at Safe was thus to use *systematic numerical flexibility* to ensure that only the amount of labor needed at a given time was employed.

This differs from what Joan Woodward found to characterize small and unit batch production in 1960s Britain, where firms did not lay off workers in slower periods because they were afraid to lose their skills (Woodward 1965). Rather, for Safe the benefits of numerical flexibility outweighed the disadvantages of letting skilled workers go. While worker know-how was important in problem-solving, the critical knowledge was understood to reside with the engineers at Technical. Hence, the need for skilled workers in Safe's production was not an obstacle to organizing work to accommodate for systematic use of temporary labor. And as I have showed, there were other benefits of employing migrant workers, such as their availability to work long hours due to their separation from their families.

Employee-driven innovation was not emphasized at Safe, and such innovations were the product of the ingenuity of workers in problem-solving, rather than a systematized practice. The lack of procedures also meant that there was no object on which to mobilize worker's knowledge by way of continuous improvement, as prescribed by

Lean. Knowledge remained embodied in workers, and might be discussed among them, but was not formalized into procedures.

Executives and owners of Safe explained the use of temporary labor as necessary in order to keep fixed costs down. The use of temps did not start with the new strategy, but had roots going back to the 1980s. Hence, different generations of executives at Safe had seen numerical flexibility as advantageous over a long period of time. The current use of temps was organized through a staffing agency in the context of the European labor market's eastwards expansion. But the rise of staffing agencies and the EU's eastward expansion was not the cause of systematic numerical flexibility at Safe. Rather, it was the context giving shape to the way temporary labor was used. Both this and the previous chapter have shown how Safe deviated from central tenets in the NCM, namely those of delegating responsibility to workers and mobilizing know-how by way of EDI. The next chapter will explore the consequences of systematic numerical flexibility for industrial relations. First, however, I will turn to a different way of mitigating labor costs, namely robotization and EDI at Metal Industries.

Metal Industries: Robotization and Mobilization of Worker Knowledge

The strategy of cost-cutting followed by Metal Industries entailed labor-cost reduction through increased robotization. This was feasible because output at Metal was stable year on year. The smelter had been producing at full capacity for decades. Reducing the cost of labor therefore became a question of increasing productivity per labor hour rather than changing the amount of labor used. At the time of my fieldwork, several robotization projects were ongoing. Automation at Metal, however, had a longer history, and while robots, artificial intelligence and "industry 4.0" are often discussed as something qualitatively different[46], my informants at Metal saw robots as just another step in the long march of automation. As Terje the shop steward explained:

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[46] See for example Brynjulfsson and McAfee 2014.

The way I see it: during all these years, there have been enormous changes, more and more tasks are being automated. We talk about robots as the great revolution, but for the people working in manufacturing, is this really something new?

This view was echoed by Ole-Martin, an operator who had seen his former job being taken over by a robot; his job now was to oversee the robot. After spending a day with Ole-Martin, I was impressed by how the robot used advanced optics and arms with suction cups to build various types of brick wall, consisting of 20 different types of bricks. Ole-Martin, however, having overseen the robot for over a year, was long past any fascination with the seemingly autonomous machine:

We have a dishwasher in our house. It performs a variety of tasks as well: rinsing, drying, washing and so forth. The robot is programmed to do everything it does. The algorithms state basically: if this happens, do this. It is the same thing, basically.

This puzzled me and I became curious about what robotization entailed on the shop floor of Metal Industries. Was the talk of a new industrial revolution exaggerated, or did the talk of industry 4.0 point to drastic changes on the shop floor? Marcus was head of robotization at Metal and convinced that robotization was indeed something qualitatively different. This conversation occurred both after I had spent a day at Saw 5, where metal slabs of aluminum are cut by a fully automated machine, and a day with Ole-Martin and the bricklaying robot.

Me: I spent yesterday at Saw 5 and it seems to me it pretty much does the whole job itself. So I wonder, what is the difference between the new bricklaying robot and the older automated saw? Aren't both programmed to do what they do?

Markus: Yes, it is like a robot, strictly speaking.

Me: So all the talk about industry 4.0 and robotization, the saw [which was installed over a decade ago] is also part of that?

Markus: erm, noooo, how to best explain it. [..] Saw 5 is an early example of automatization. What we are doing now is robotization.

Me: But what is the difference, what makes the bricklayer into a robot and not the saw? Is it the movable arms?

Markus: Yes, but also the fact that the robot [bricklayer] has machine vision. He looks at the brick and decides that "OK, this is the brick I need". But the saw, it just goes like "OK, something is coming on the conveyer belt, I will cut it". Whether it is an aluminum slab, an arm or a pole or iron, it won't make a difference [to the machine]. It is highly automated, yes, but not as smart as the robot.

According to Markus, then, the robots currently being introduced represented something new, and more than mere automation. In the following I will discuss two robotization projects at Metal and some of their consequences, in order to understand the nature of firm development at Metal.

The most advanced robots at Metal are the pair of bricklayers together with two autonomously guided vehicles (AGV). The former were installed a few years ago, and initial troubleshooting and adjustment of work routines were for the most part completed. The latter were newer, and at the time of my fieldwork, the project was still in the implementation phase. That is, negotiations to adjust manning and work routines after the AGVs' introduction was still ongoing. The AGVs were still an object of disagreement between operators and management, especially over matters of exactly how much it reduced the work load for operators.

Introducing new technology in production entailed working out how it affected tasks and procedures regulating work. In Norway, the *Working Environment Act* [AML] specifies that workers are to be consulted in processes affecting their work situation[47]. At Metal, the participation of operators in implementing new technology had roots back to the mid-1970s. Mathis the manager had been responsible for the

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[47] Excerpt from section 4.2 (1): The employees and their elected representatives shall be kept continuously informed of systems used in planning and performing the work. They shall be given the training necessary to enable them to familiarise (sic) themselves with these systems, and they shall take part in designing them. (English version of AML at Lovdata accessed 9th of Feb 2021: https://lovdata.no/dokument/NLE/lov/2005-06-17-62)

implementation of the bricklaying robots, and I wondered who now was responsible for the task the robot had taken over.

> Mathis: One of the former bricklayers who became redundant when the robot was introduced.
>
> Me: So operators have kept responsibility for the tasks that the robots took over?
>
> Mathis: Yes they have been involved since the start of the project. It makes everything a lot easier. What is important is to involve operators as early as possible so they own the process. Then they get knowledge from the project which they use to teach the others on the shift. All departments here try to get operators on board on all sorts of projects really.

Another important context of the robotization at Metal was the compromise between the trade union and Metal that no one was to lose their job due to robotization efforts. Operators who were made redundant would receive an offer of doing something else. In return, Metal expected the trade union to support the robotization drive. This compromise will be discussed more closely in the following chapter, but is mentioned in passing here due to its direct relevance to robotization.

Bricklaying Robots

The robots building brick walls were amongst the most advanced robotization projects at Metal. They were located in the bricklaying shop, at the far end of the anode bakery. Their purpose was to build brick walls for the pits where anodes were baked. Earlier, this was done by a team of four operators, working day and afternoon shifts as necessary. But now the construction of walls was handled solely by Ole-Martin, a former bricklayer. He oversaw the two-story shop, which consisted of a brick storage room downstairs with the construction of the wall taking place upstairs. Downstairs a robot loaded bricks onto a conveyer belt, feeding the wall builder robot upstairs with the right brick at the right time. During my stay in the brick shop with Ole-Martin, he would often get some error message from the robot and have to solve some problem to get it going again. While we watched the robot downstairs pick up stones it

identified by laser with its one arm armed with suction cups, Ole-Martin explained how this was done pre-robotization:

> We did this manually in those days. We would lift the stone up to the second floor[48]and build the wall ourselves. Several of my colleagues during that time told stories of how they woke up at night with aching arms and shoulders. [..] In principle, I don't like the fact that robots come and take over workers' jobs, but I haven't heard anyone complain here in the bricklaying shop. This is a hard physical job, and we who work here are old.

Ole-Martin later explained how he saw robotization and the future of Metal Industries in Lillevik:

> I think robotization is something we have to do in order to survive. It is necessary. I will retire in a few years, so it isn't important for me personally, but for Lillevik it would be a tragedy if Metal were to close down.

Ole-Martin's statements illustrate two widely held notions about robotization at Metal: Firstly, that robotization was about removing hard jobs, such as the lifting of heavy bricks to build walls; and secondly, while robots might make some jobs redundant, it was a necessary part of staying competitive in the aluminum business. Hence, the bricklaying robots were seen in a positive light in the brick shop. However, as these reflections from the field diary show, there were also fears of the whole bricklaying operation being outsourced.

> Why do they modernize with robots here in the brick shop, where there is already plenty of capacity? The operators tell me there is no hiring of new people at the brick shop. Do they plan to get rid of the whole operation? Maybe to automate the whole thing or get some outside firm to take over, like they have done at several other stations in the smelter? Ole-Martin told me that the construction of walls does not fall under the core competence of the smelter, as it is seen as maintenance [which is usually done by outside firms]. In the lunch

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[48] The wall is constructed on the second floor because it is lowered as it becomes taller, so the workers or robots always can lay down brick at the same height. When the wall is finished, it is almost as tall as both floors taken together.

room I met five guys, so money can probably be saved through increased automation.

Thus, it would seem that the introduction of robots made the outsourcing of the whole bricklaying operation possible, meaning that Ole-Martin would not be replaced when he retired and that his younger colleagues might have to find something else to do[49]. Outsourcing was not something Ole-Martin and his fellow operators desired:

> Ole-Martin: If bricklaying is outsourced, we will probably be offered a job in the firm that takes over the work. But many of us are close to retirement, and that will mess with our pensions. And besides, other firms might have assignments in other towns as well. So all of a sudden you might have to go there to work. And many of the people here, they have never worked outside of Metal.

However, using robotization to prepare the ground for the outsourcing of bricklaying had proved difficult for management at Metal:

> Ole-Martin: When they introduced the robots, the idea was to share responsibility for it among all the operators in the anode bakery. But [name of company supplying robots] said "That is a really bad idea. You need to stick with a few people who can learn it well. It will never work if you share it among many operators."

The story of robotization in the brick shop shows how the consequences of technology for work weren't given in advance. Management hoped to use the new technology to outsource the bricklayers (whose jobs also included the changing of walls in the pits, a task that had not been robotized), but the robots needed skilled overseers for continued troubleshooting, and therefore the responsibility for them should not be spread "thinly" across several shifts. Hence, Ole-Martin and his fellow bricklayers were not outsourced, but kept their jobs with Metal, even though their tasks were not a primary activity. The outcome of robotization in the brick shop then (at the time of fieldwork), was a combination of both the relations into which the robots were

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[49] This would be inside the smelter, as an agreement between the trade union and the firm stated that no one was to lose their job due to robotization. This will be explored further in the following chapter.

integrated, as well as the qualities of the robots (needing skilled personnel to troubleshoot them). While this particular robotization was viewed positively by operators I talked to, the introduction of AGVs in electrolysis was met with more skepticism by operators.

Autonomously Guided Vehicles

The biggest part of the robotization drive during my stay at Metal was the implementation of AGVs, going under the names of Wallace and Gromit. Their job was to move inputs to furnaces and transport used materials away. Their introduction was discussed a lot by operators[50], and trade union and management were negotiating exactly how routines could be changed and manpower saved. This meant that the AGV as a topic was something I would stumble across much more often at Metal than I did the bricklayer robots. While the industrial relations side of robotization will be dealt with in the following chapter, the implementation of the AGVs differed from the bricklayer robots in several ways.

While the bricklayer robots had made quite an impression on me, the AGVs did not seem so cutting edge. To me they looked like transport robots in hospitals, moving bedsheets and other materials around. But, according to Marcus the head of robotization, these AGVs represented cutting-edge technology. They also represented "low-hanging fruit" he explained, because there was a lot to gain from the implementation in terms of savings of labor time:

> We could have started outside, that would have been easier. Instead, we decided to start in electrolysis, because there we have a strong magnetic field which complicates things. If we can succeed with AGVs there, we can do it everywhere. Besides, there is a lot to gain there, a lot of routine driving by operators, such as inputs for production. Our vehicles there were old as well, so

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[50] While looking at the robots, I noticed a sticker on the back with the Skynet logo, put there by some trickster I would later learn. Skynet is the fictional evil corporation in the *Terminator* franchise of films that accidentally invents artificial intelligence and starts the war between machines and humanity. Whether this was pointed a statement in regard to the robotization drive, or just for fun, is of course an open question.

we had to invest there anyway. Then we decided it was better to just go straight for robotization than buying new operator-driven vehicles.

As with the bricklayer robots, the motivation for AGVs was to reduce the number of operators. To what extent the AGVs would achieve this was still an open question. The AGVs differed from the bricklaying robots in that their improvement of EHS was not as apparent. Driving was a relatively comfortable job relative to building brick walls, hence there were no obvious EHS advantages to Wallace and Gromit, as had been the case in the brick shop.

What the AGVs did affect in a significant way was the work of other operators in electrolysis, which now had to be structured in a new way. Since there was a safety distance from the AGV to people, it would halt whenever it recognized people within a certain perimeter, or if it encountered obstacles. Odd Jarle the operator explained how this inconvenienced work for operators:

> One thing is to get the robot to function. But you also need to get the people to function alongside the robots. You cannot move stuff around in electrolysis now, because then the robot freaks out. Because he remembers the route he drove last time. But now there is a table there. I explain it to people this way: We have gotten two autists in here, working with us, and we need to keep that in mind at all times [implying that autists need predictability and structure].

Thus, the introduction of the AGVs not only had the potential to reduce the number of operators on the shift, it also created a need for stricter regulation of the space in which the operators and robots were interacting. While most people I talked to at Metal were positive toward the overall robotization drive, there was skepticism towards the AGVs. The casting-hall operator Oscar was among those skeptical of both the intention and effects of the robotization drive:

> Oscar: [..] and then there is another thing with the robots; what is going to become of the people that the robot replaces? Is that why we do robotization here, to save money on wages?
>
> Me: I would assume so?

Oscar: They claim it isn't, but I know what I believe. They say it is not going to hurt the workers, but if the robots do everything, what are the people going to do then?

Me: No there will not be much left..?

Oscar: So really they are lying to themselves when they say such things. Of course it is for saving money on wages.

Me: yes cutting costs…

Oscar: Of course, when you can use one AGV and then save wages for six operators [there are six shifts], that equals a couple of million [kroner] a year.

[..]

Me: Anything else you want to add?

Oscar: No I would just like to say that this is a really great place to work.

While Oscar was in general happy with his employer, he was skeptical towards the increasing presence of robots in production. And while most operators would emphasize the need to use robotization to cut costs and secure the jobs at the smelter, the context highlighted by Oscar was also part of robotization. While robotization was not unanimously applauded by operators at Metal, it was widely agreed that it was a necessary part of securing the jobs at the smelter for the future[51]. A more immediate consequence of robotization was the increasing need for rules governing production.

Procedures

The previous chapter showed how procedures standardized tasks in the labor process at Metal. These became more important with robotization because the need to structure the work environment increased with the introduction of AGVs. This entailed changes in the organization of work, and exactly how much labor was reduced by the AGVs was a topic on which operators on the shop floor and managers charged with

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[51] More on this in the following chapter.

cutting costs in production disagreed. These discussions belonged to the realizing gains phase of projects at Metal introduced in chapter four:

Proposal for investment -> Investment and modernization - > Realizing gains - > New cycle

Magnus the manager was responsible for the implementation of Lillevikian Lean at Metal, and argued that the AGVs did indeed free up operators to perform other tasks.

> Magnus: Operators argue that AGVs haven't freed up any labor, because they have trouble elsewhere and transfer people from driving to other tasks by themselves. Still, there is no doubt that AGVs do a great deal of work, you can discuss exactly how much of course, but they drive around every single shift. And that has consequences because it frees someone from that task. So of course they must be open to the idea of doing new things.

The difficulty in realizing gains (by reducing manpower) from the implementation of AGVs lay in measuring exactly how much labor time was saved by AGVs. Operators who now were free to do other things argued that they kept busy by solving problems elsewhere, or by troubleshooting the AGVs. Still, Magnus was adamant that AGVs had reduced the need for labor, and should entail a reduction in manpower. Operators, on the other hand, would contest this. Magnus saw further mapping and codification of the labor process as the way to resolve this contradiction:

> In my view, management don't have the necessary overview of tasks in Electrolysis. They [tasks] are not defined with the necessary precision, or mapped sufficiently. Therefore we are discussing now whether to do a mapping process like we did at Anode Bakery earlier, where we examined production flow. The scale in Electrolysis, however, is much bigger. [Goes into numerical details of the scale of the mapping job] That will be a lot of work!

Thus in Magnus's view there was a lack of knowledge about what occurs in Electrolysis regarding tasks and operations. A more thorough mapping of tasks would have allowed for easier negotiations of manpower reductions. Another consequence of mapping and increased regulation of work by procedures would be the increased standardization of

work. The more detailed the procedures for a specific task became, the more they would define a "best way" of doing things.

Writing down how tasks are performed involves a transformation of know-how into information (Lundvall 2016); from a relatively place-bound, almost tacit form of knowledge, into written knowledge, that can be converted into bits and travel the internet or other computer systems. This is not to say that procedures written for a job operation at Metal could be understood outside the smelter, as even formalized knowledge depends on the correct interpretative scheme on the part of the receiver. Still, the writing and re-writing of procedures involved a continuous transformation of embodied knowledge into standardized written rules for how tasks should be performed. An intermediate step in this process was the externalization of knowledge in discussions between operators on how to best perform the various tasks. At Safe, this process would stop at externalization as procedures were not seen as relevant examples of best practices. At Metal, however, the knowledge would become standardized in procedures. As procedures were a combination of efficiency and safety concerns, they also regulated movement inside the production halls. The introduction of AGVs increased the need for regulation of movement to allow the smooth interaction between robots and operators. Hence, it is possible to understand the procedures as providing an interface between people, production and robots, so that an algorithm and the hardware it controls can perform a work process. Hence, it would seem that the more a work process is ruled by instructions and procedures, the easier it would be to robotize it. This robotization, in turn, demanded further standardization. In addition to providing an interface for interaction between man and machine, procedures also enabled the systematic mobilization of operator knowledge for incremental improvements to the labor process.

Participating in Employee-Driven Innovation[52]

For senior executives at Metal, continuous improvement was an integral part of the story of why Metal was "one of the best smelters in the world". Operator[53] knowledge was used for two purposes. To improve work routines by changing the procedures describing them. Or by improving equipment or machinery used in production, from a small change in a staircase railing to comprehensive remakes of equipment. Improvements to procedures were discussed at regular *improvement meetings,* where operators from different shifts met with management to discuss challenges in production. As the operators had different roles on each shift, one such meeting would typically consist of one person from each shift, for example the one with responsibility for the fire-haul.

There were also suggestion boxes, in the form of iPads, where operators could come up with suggestions for improvement to be reviewed by the relevant manager. If suggestions were deemed to have potential, a group was formed, with the operator being a member, to try and operationalize the idea for improvement. To have potential, an idea had to improve either EHS or efficiency. If an idea could improve both of these and was also affordable, it had good chances of being implemented.

Sometimes, operators would just register a *work order* describing an issue and marking it as something to be fixed by a mechanic or electrician. This meant that the improvement would go unregistered, but operators were often skeptical of management's ability to treat suggestions fast enough, and therefore just decided to get things done by themselves. The operator Ole was disillusioned with the whole

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[52] Inside the factory gates at Metal, continuous improvement was the concept used to describe a number of ways operators' knowledge were mobilized to make production more efficient or safer. In the following, I will describe continuous improvement as understood by management at Metal. For other instances of operators' knowledge being used for effectivization, I will use the concept of Employee-Driven Innovation, in accordance with the way such practices were described at Safe.

[53] It was mostly where operators worked where knowledge mobilization was attempted in organized ways.

system of continuous improvement, and for the most part decided to just get things done himself:

> Me: If you want to improve something, do you make a suggestion [on the iPad] or do you just write a work order?

> Ole: If you want things to actually get done you need to write a work order. I don't understand why Lean doesn't work here, when it works so well at Toyota.

> Me: Do you have an example of a suggestion?

> Ole: Take the railings around the pits for example. They are fastened with a hook now. We asked them to just make a bend in the posts to make it easier to fasten it. They did it on a few, then it stopped completely. I have no idea why.

Most operators and managers I talked to at Metal were quite proud of how well EDI and Lean were practiced at Metal, and while Ole was critical, he had not stopped coming up with improvements.

The notion that the system for suggestions with the iPad did not work was not limited to skeptics such as Ole, but was widely held among both operators and managers. The main problem was seen as a lack of capacity on the management side in handling incoming suggestions.

> Magnus the manager: The general idea is that it should be easy to come up with suggestions. We started the new way of registering suggestions last year, but we have gotten far more suggestions than we have managed to deal with. So we are trying to get better at it. [..] We hope that we can achieve our goal of addressing all suggestions in an efficient way. We saw that the response [of operators] was very good to begin with, but we haven't been able to respond to all the suggestions, so that is a challenge. At least we should be able to give feedback quickly, even if the proceedings take longer than anticipated, we need to communicate that back.

The fact that the number of suggestions exceeded Metal's capacity to address them is interesting in light of another change to the system for mobilizing operator knowledge for improvements, namely the removal of monetary bonuses for coming up with good

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suggestions. This bonus was primarily for suggestions toward improving equipment, as improvement of procedures was regarded as part of the job of an operator. Terje the shop steward explained how these incentives had been used before:

> There is still some way to get a monetary bonus I think, but it doesn't work the way it used to. We have had a lot of discussions on this issue. I know of several suggestions that have given operators a nice amount of money. And it triggers people to think about improvements in general. The ordinary operator, if he gets 50 000 kroner for a suggestion, that is a quite substantial sum. When you remove such incentives, people won't bother coming up with suggestions, is the way I see it.

Terje went on to tell a story of an operator coming up with an idea to change the casting equipment, enabling the casting of larger slabs of aluminum for a small but critical change to a metal frame. According to Terje, this meant millions in increased profits for Metal, while the operator got a nice bonus of 100 000 kroner, as the bonus was calculated according to how much money it saved Metal. Other shop stewards however, held different opinions of the bonus system:

> Truls the shop steward: You don't invent the wheel by yourself, you invent it together with other people. It is the same with writing procedures, job observations and all these things. That is why I am against bonuses for improvements. If you give people bonuses for ideas, they start to keep ideas to themselves, because they want the bonus for themselves, and then the idea is perhaps only 30 percent as good as it could have been, and then you might not see the value of it, and you drop it altogether. The idea would be far better if you worked in a larger group, improving it together.

I was puzzled by the shop steward's opposition to bonuses. After all, wasn't it reasonable that operators be compensated for their contribution to increased company profit?

> Truls: Or you could say that it is reasonable that you contribute to securing the jobs here in Lillevik. Moreover, maybe the reason you came up with the idea is that you saw something while on the job, would you have done that if you were sitting by yourself at home? There are many aspects of this that need

consideration. [explains in great detail how he and other operators once came up with an idea about improving safety procedures for the crane, with the point being that the discussions back and forth were important in improving it].

Me: What you say about the bonus for ideas, do you think it's the majority view?

Truls: I think many people miss the bonus side of it. Back in the 80s, there were people who got a lot of money from it. I came up with suggestions in the days where you could get money for it, but then I really had to fight to make the company understand that the idea was useful. In the end, however, I didn't get any money. But we learned that if we cannot discuss these things together, then the proposals don't become good enough [..].

While the majority of operators might have wanted to keep the bonuses, the fact that their suggestions kept flowing in even after the removal of the bonus points to some other motivation for suggesting improvements. Truls argues that contributing to improvements is both a duty and a collective endeavor, and important for securing the jobs in Lillevik. This should be understood in light of the trade union's focus on job security, which will be discussed in the following chapter. The continued flow of suggestions after bonus removal can be fruitfully understood in light of the topic of the previous chapter, the organizational form of the autonomous team and the work practice it entailed.

The previous chapter showed how operators were given a large degree of responsibility for problem-solving and coordination in production. A consequence of this was an understanding of the problems of production as the problems of operators. Truls' view that participation in continuous improvement is an obligation can be understood as an expression of this. Not only are problems in the day-to-day production of aluminum the responsibility of operators; they are also responsible for *improving* the process of production. In the previous chapter we saw how Oda reacted to attempts to infringe on team autonomy, defending the space within which the team was the decision-making authority. The participation in continuous improvement can be understood as the other side of this coin. In the operators' view, they have a right

to govern themselves in the space demarcated by procedures and delegated authority, and with the right comes a duty to participate in improvement.

The participation in continuous improvement then, is closely connected to team organization. The following episode described by Magnus the manager serves as an illustration of this logic:

> Me: You said you were well received at [place in smelter] when you came to do time studies, why is that you think?
>
> Magnus: The preparation. When you enter a place like that[54], you can't count on being accepted by operators and auxiliary workers, when you tell them that you are there with a stopwatch to record how much time they spend on each operation. But we got really good feedback down there. After the research we summarized our findings in a meeting with all the workers. And they applauded, they were happy. Before we went down there, we feared we were going to be given a mouthful. Instead, they invited us back: "Can't you guys come to [area] also, we have some trouble over there." So people want to do a good job, they don't come here to shirk their duties.

Here, the function of Magnus's preparation is to negotiate access to the "space" within which the team is responsible. He is not formally obligated to do any such thing, but respecting the understandings of team autonomy, Magnus negotiates access and acceptance for the time studies project, a project which in turn is embedded in the broader understanding of the need to continuously improve in order to safeguard jobs, as well as the notion that problem-solving and continuous improvement are the responsibility of operators. Keeping this in mind, it is no surprise that Magnus is not given a mouthful, but instead invited back to help operators improve other areas of production as well. Participation in EDI or time studies at Metal should not be understood as motivated by a transactional logic of something for something, what Applebaum et al. (2013) call contractual obligations. Rather, it was motivated by informal contracts, or a relational logic of a common interest. The formulation of this

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[54]In Magnus's eyes, this particular place in the smelter was a rougher place than Electrolysis, hence he expected a less positive welcome than he would have in Electrolysis.

common interest will be discussed further in the coming chapter. The point here is to show its relevance for increasing the competitive power of Metal by increasing the value of labor. Not only is the physical work utilized; worker knowledge is also mobilized in order to justify the relatively high wage levels of Norway. As mentioned in the previous chapter, continuous improvement was not only seen as a duty of operators. It was also a way to influence the way their tasks were standardized, participating in a collective process of explication of knowledge, which in turn was standardized into procedures. Hence, the practices that managers and operators at Metal understood as a Lillevikian form of Lean very much resembles what Adler calls democratic Taylorism; a combination of continuous standardization of tasks, with operators influencing the process and thus their own work.

Mitigating the Cost of Labor in the Making of Metal

Robotization was an important part of how management sought to reduce labor costs. Automation or robotization of tasks would eventually make manpower reductions possible, or allow for outsourcing. On the management side, robotization was understood to be something different from earlier automation projects. While some on the shop floor were skeptical to robotization, the robotization drive was understood in light of the need to stay competitive in order to safeguard the jobs in Lillevik. A prerequisite for robotization was the predictability inherent in production. While unforeseen events could arise, some tasks would have to be done in the same way for the foreseeable future, such as the moving of inputs in electrolysis. In addition, the stable demand for Metal's output allowed the smelter to produce at full capacity, making labor-cost reduction a question of incremental process innovation or continuous improvement, rather than the systematic numerical flexibility at Safe.

With the introduction of AGVs came an increased need for regulation of the labor process in procedures. The robots were dependent on a predictable environment in order to find their way. In addition, negotiations over exactly how much necessary labor time was reduced spurred further mapping of the labor process. Hence,

robotization both presupposed codified knowledge of the labor process in the form of procedures, and led to increased codification. This codification of tasks was in turn connected to the way the value of labor was increased at Metal, namely through the mobilization of worker knowledge.

Employee-driven innovation at Metal included both Lean-inspired practices of continuous improvement and workers taking initiatives for improvement of their own. EDI was used both to improve equipment and procedures. The writing and improvement of procedures entailed a movement and transformation of knowledge from tacit, experience-based know-how into explicit facts and information – know-what (Lundvall and Johnsson 1994). This led to the establishing of best practices, and allowed for reflection on and improvement of procedures, and hence the way tasks were performed. The understanding of work became an intersubjective one, open to being improved by collective (or individual) reflection of operators. One way to put it is that having procedures that were relevant for the way tasks were performed not only guided work, it also provided an object upon which the collective knowledge of operators could be brought to bear, by way of continuous improvement. This does not mean that tacit knowledge did not matter anymore and that procedures made workers' skills superfluous. Rather, the point is that there was a continuous process of knowledge transformation in which the procedures represented the congealed knowledge of operators. And, as the work environment was not static, this process had to be a continuous one: procedures would continuously be outdated by the continuous incremental improvement of the labor process.

Operators' participation in this knowledge mobilization was not primarily motivated by bonuses but by an understanding of the problems of production as the problems of operators. This understanding sprang out of the organizational form of the autonomous team, where operators had responsibility for production and the problems of production. Participating in continuous improvement, then, should not

primarily be understood as a question of motivation by bonus, or rationalization about job security, but as a naturalized habitual practice embedded in the job of operator.

Two Tales of Firm Development

This chapter has demonstrated how the reduction of labor cost takes different forms at Safe and Metal. For Safe, the burning question is "how do we fulfill this contract?" While for Metal it is "how can we produce one ton of aluminum cheaper?" Safe is positioned in two markets: an offshore market in which investment has fallen sharply, and the construction market they are *reorientating* to. In the latter, they do not have an established position, but are dependent on succeeding in completing a few large, critical contracts, which will give them a standing in the market and among consultants who evaluate and structure calls for tenders. Hence, their need for labor varies with the number of tenders they win. The solution preferred by owners and executives is systematic numerical flexibility, adjusting the number of workers in accordance with need.

Like Safe, Metal is engaged in market competition, but in Metal's case the market is characterized by predictability and production at full capacity throughout the year. This means that the main challenge is not to scale the number of employees up or down in accordance with constantly changing levels of production; rather, it is to ensure that each ton of aluminum is produced as cheaply as possible. The primary way to reduce labor expenditures in this equation is through robotization. This is also seen as important in safeguarding jobs in Lillevik for the long term, by making the smelter more efficient. Robotization both needs as well as encourages detailed procedures regulating production. The procedures were important for how the value of labor was increased at Metal because they created an intersubjective understanding of tasks. They also provided an object upon which the mobilized knowledge of operators could be brought to bear, allowing operators' knowledge to make incremental improvements to the labor process in a systematic way. This knowledge mobilization entailed a transformation of knowledge from tacit know-how to explicit know-what.

At Safe, the most important aspect of worker knowledge was that it allowed for "concurrent production" by solving problems on the fly.

This chapter has examined one aspect of *firm development*, namely the mitigation of labor costs, and showed that Safe and Metal sought to achieve this in different ways. At Safe, the variable need for labor was solved by systematic numerical flexibility, while at Metal the goal was to increase productivity per labor hour, which was achieved by robotization. The unpredictability of the labor process at Safe and the stability at Metal meant that the potential for mobilizing worker knowledge was greater at Metal, since the standardization of tasks could be continuously improved. Procedures thus constituted an object upon which operators' knowledge were brought to bear. At Safe, the execution of tasks was much less standardized, making continuous improvement or EDI less feasible.

A central idea in the NCM is *cooperation for firm development.* I have demonstrated how development was achieved in different ways at Safe and Metal by focusing on labor-cost mitigation as an aspect of such development. This difference should be understood in the context of the preceding chapters on strategies and the labor process, which were crucial in informing the way labor costs were mitigated at Safe and Metal. With this understanding of the differences in how firms were developed in place, it is now possible to move on to the last aspect of the factory regimes – industrial relations – which will address the cooperation part of *cooperation for firm development*. When I have discussed development before cooperation, it is because the form of firm development has consequences for cooperation. The phrase *cooperation for firm development* seems to suggest that trade unions and firms sit down to cooperate and then develop the firm on the basis of this cooperation. Instead, I will illustrate in the next chapter how cooperation does not necessarily occur prior to development, but is rather intertwined in strategy, labor process and development (understood as labor-cost mitigation). Hence, this and the two preceding chapters have explicated the terrain upon which cooperation in industrial relations takes place.

Chapter 7: Industrial Relations

Cooperation for firm development is central to the Norwegian cooperative model. This chapter will continue from the understanding of firm development in the previous chapter, and show how conflict characterized industrial relations at Safe, while cooperation reigned at Metal. Industrial relations cannot be reduced to the wisdom of individual managers or shop stewards; they are embedded in narratives. Drawing on the observations from the three previous chapters, this chapter will understand conflict and cooperation in light of their respective meaningful contexts, thus answering the question of why industrial relations differ between the firms.

At Safe, the interpellation of simple control in the labor process, frustration with the use of temporary employment, and the changes executed by the new executives led to a state of affairs in industrial relations that I characterize as *negative class compromise* (Olin Wright 2015). The *positive class compromise* at Metal Industries rested on the operators taking responsibility for production and the formulation of a common interest between firm and trade union in securing the jobs in Lillevik. In the investigation of the cooperation at Metal, I will draw on Therborn's concept of *ideology* together with Gramsci's concept of *hegemony*.

Cooperation can be argued to be the central feature of the idea of an NCM. When the analysis of it has been placed towards the end of this dissertation, it is because the three previous chapters have been necessary stops on the way towards the understanding of cooperation that will be discussed in the following. While previous chapters have shed light on the context of cooperation, it is now time to focus on cooperation itself, and the relation between trade union and firm.

Industrial Relations at Safe: A New Authority

"The new executives, they are quite hard on us"

Olav, trade unionist

"They [workers] might be a little bit behind on parts of the adjustment process. So we try to bring them with us at every step."

Mons, executive

Safe Manufacturing is a member of the employer association for Norwegian industrial firms, *Norwegian Industry*, which is a member of the umbrella for all the employer associations, *The Confederation of Norwegian Enterprise* [NHO]. The shop-floor workers are organized in *The United Federation of Trade Unions* [Fellesforbundet], which belongs to the trade-union umbrella *Norwegian Confederation of Trade Unions* [LO]. Thus, Safe Manufacturing very much belongs to the organized part of Norwegian working life, both on the employer and employee side. One aspect of the agreement between *Norwegian Industry* and *The United Federation of Trade Unions* that separates it from similar agreements in Norway is that it grants workers the right to go-slow industrial action, to deliberately work slower as a tool of labor conflict. The last time workers used this weapon at Safe was in the early 2010s as part of conflict over wages. Hence, the conflict was still remembered by most of the Norwegian workers at Safe. Mads the leading worker had been a trade-union activist at the time:

> The oil price collapsed during the negotiations, from one day to the next. We were discussing wage increases, but suddenly, they changed their position overnight and offered nothing. And at that time, we had already had two negotiations with zero results [*nulloppgjør*] in a row.

While the industrial action did not achieve much for the workers in terms of wage increases, Mads maintained that it was nonetheless important as it served to demonstrate to the new executives that the trade union was not to be trifled with.

Olav, another prominent trade unionist at Safe, did not think the go-slow action had gained the workers much at all.

> Olav: Back then they [Safe] could only re-schedule a few projects [when we had the go-slow action]move around on some projects, because there wasn't much to do in the middle of the oil crisis. So in that sense, we were not able to hit the firm very hard, and I don't think we achieved anything at all.

Olav even implied that the go-slow action was not a major problem for Safe, as there was not enough work to be done anyway, and thus that the consequence for the firm was just having to pay workers less. While there were different opinions on how efficient the last round of industrial action had been on the shop floor, the one thing that everyone seemed to agree on was that there had been a fundamental change in the leadership of the firm: a new regime had replaced the old regime, with substantial consequences for the relation between the firm and the trade union – also, that the old regime was preferable to the new one.

As was explained in chapter four, the first years of the 2010s saw a number of changes at Safe, new owners, new executives and a new strategy. The former executives, who also owned most of Safe, sold it to the private equity firm Equipriv. The drop in oil prices that came soon afterwards prompted a change in strategy, from continued growth in the offshore market to reorientation (see chapter four). The following will focus on how these changes were understood on the shop floor. While this has been described earlier, the focus in the following is on how these changes affected industrial relations, and how they were made sense of on the shop floor. *The new authorities* was the phrase workers used when talking about the new executives and owners. The change of executives was part of a larger transformation at Safe that started with the new owners coming in. They proceeded by hiring a new CEO and, over a period of a few years, the executive group was replaced. In this period, the oil price collapsed, after which followed a drop in offshore investment, prompting the new strategy of reorientation at Safe. Here the *old* and *new authority* are used to describe the period before these changes and after.

The New Authority Seen from the Shop Floor

In conversations on the shop floor, the new authority was often contrasted with the good old days of the previous management:

> Olav: Before, it was possible to rise to the top in this company by working your way up, from the shop floor almost. The people who ran things had been here a long time, and knew the firm. Today, senior management is headhunted from elsewhere. The former CEO always encouraged workers to organize, because it was easier to relate to one counterpart. The new authority will probably tell you that this still is the case today, but honestly, I don't think they are very concerned with it.

I would later learn that none of the top executives lived in Storesand, but instead commuted from other cities in Norway for the working week. According to Olav, one of the new executives was headhunted by Equipriv:

> Field diary: Olav explains that the entire top level of management are new people, and that Magne the executive was headhunted by the chairman of the board. He tells me how he has checked various online databases with information about ownership of firms and such things, and from that assumes that Christopher the board member knows Magne the executive from earlier partnerships.

The headhunting of executives stood in contrast to the executives of the old regime, who for the most part all had long careers at Safe. The fact that all of the new executives lived in other cities and commuted to Storesand by plane for the work week added to the notion on the shop floor that the PE and the executives were not necessarily on board for the long run. Expressions of dissatisfaction with the new owners and executives could often be heard among workers, but Mads the leading worker wanted to paint a more nuanced picture of Equipriv:

> Me: So everyone was organized back then?

Mads: Yes, only a few were not, generally speaking. We have had good management here for the most part, but it has been a bit scanty[55] these last few years, right? With new owners and these things. It is one of these profit companies right, they want to see a positive cash flow right away. But still, the truth is that they have put a lot of money into this company and been patient. And I have known a little bit about that, because I was on the board [as an employee representative] so it isn't always like the boys on the floor tell it.

Me: So PE has invested a lot here?

Mads: Yes indeed! The CEO needed help the first few years to turn the company into his idea of what it should be. And PE put the money forward. But not everyone here sees that, and the stories you hear are colored by that. But of course, it has been…we have had several zero negotiations[56] in a row. They [Equipriv] say that we gain the benefits of the new production hall they have built, and should be happy for that. [..] And Equipriv have invested a lot of money here.

Mads saw the new owners as a different type of owner than that they have been used to: a "profit company" looking to sell Safe within 2-3 years, instead of the incremental growth they were used to in the old days. Still, as Equipriv had invested a lot in Safe, Mads did not lament their buying of Safe but rather focused on the investments they had made.

Another frustration with the new authorities among workers was not being listened to. Oddvar argued that production would have been more efficient if the executives had listened to workers when deciding the type of software used to manage products.

Oddvar: They have acquired this new software to keep track of the various deliveries, and it has replaced the project plan we used before. There you could easily find all the information you needed in one place. Now you have to check in a lot of different places. A lot of hassle, really. So for us here in Final Assembly, it is actually worse with the new software than it was before. Management is happy with it, because it is easier to get the information they need. But we have

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[55] Untranslatable, "knabert", meaning that there have been hard times, with little money and strict financial control.
[56] Local wage negotiations where no increase in wages has occurred [*nulloppgjør*].

different needs for information when we assemble products. We protested when they introduced it [the software], but we were not listened to, I am sorry to say.

In a similar vein, Olav was not happy when talking about the way the new production hall built in 2012 was designed.

> Field diary: Olav talks about how the ventilation in the painting hall is terrible, and how the vents should have been placed along the walls so they don't clog up as fast. But when the new production hall was built, one of the cheaper contractors were chosen in order to save money.

While money was saved when choosing contractors for the new production building, the wages of executives increased. Adding to this frustration, wages had not increased in a long time, and an old agreement where 10 percent of profits were paid out to workers as a bonus had been removed.

> Olav: Under the new authority, the wages of executives have increased from one to two or three million [kroner]. Last year, [name of executive] got a big bonus because he reached his targets for cutting costs. A big part of his accomplishment was to fire 17 workers in production.

This was not seen in a favorable light by Olav or his colleagues, and the way Olav saw it, their angry reactions had inspired executives to put a lid on discussions of wages between management and workers in production.

> There was a woman who worked with EHS[57] who got 60 000 kroner in bonus, and talked about it while she was down here in production, then people got angry and wanted to know why the administration got bonuses while wages in production stagnated. She was given a stern talking to by management and they explained that "we don't talk about our wages with the people in production".

The owners argued that workers should be grateful for all the investments done by Equipriv, instead of complaining over wages.

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[57] Meaning that she was working in an office in the administration building, located above the production halls.

When we lost the bonus and they built the new hall, we said "You have taken our bonuses and spent it on a new construction hall." The CEO denied this, but when we complained to the chairman of the board about the removal of the bonuses he told us that we should be happy as we had gotten a new production hall for the money. Magne [the senior executive] says that it is the present that matters, not all the old practices that aren't written down in agreements anyway.

This excerpt from the field diary is from a day spent with Olav and Oddvar in the painting hall, where several hours were spent listening to stories and complaints about management. While Olav was not the formal leader of the trade union, he was the one workers turned to in trade union matters, and thus acted as an informal leader. Two points from the last excerpt should be understood in a wider context. The chairman's appeal for workers to forego short-term interests (bonuses) because their long-term interests are satisfied by investments (production hall) instead, might have been possible at Safe had there been a stronger idea of a common interest, of "being in the same boat". But as has been shown so far, relations between the new authority and the Norwegians on the shop floor instead developed in the opposite direction, towards increased polarization. Magne the CEO's insistence that old informal agreements are not important anymore, illustrates this well. Under the new authority, then, trust between the trade union and the executives diminished.

The lack of trust or formulation of a common interest meant that in situations where there was a need to mobilize extra effort from workers, executives had to offer monetary rewards in addition to appealing to a common interest.

Odin: We are paid extra on top of overtime now, to work on the [name of critical reorientation project]. 100 percent instead of 50, and 150 percent when we should get 100 percent. No one can afford to say no to that kind of money. Even I, who swore I would never work overtime again, am back here every Saturday.

Olav the shop steward explained how the CEO had gone through the trade union in order to mobilize the extra hours needed for critical reorientation projects:

If people work normal hours, they have 5 000 hours. They need 11 000 hours to complete the project before the deadline. So they depend on people being willing to work overtime to finish the project in time. The Eastern Europeans are interested in working as much as possible. But the executives also had a meeting with the union where they presented the current state of affairs, and put some money on the table. 90 percent of the people there said they were positive when it came to working overtime. [..] So in that sense, they have secured commitment from the shop floor. [..] The CEO signaled to us that if we contribute now, we have good cards to play when the local wage negotiations come up this fall.

Despite tension in industrial relations, Safe was able to secure commitment to critical projects by increasing pay for overtime and promising permanent pay increases down the line. The new CEO's dismissal of the old and informal (as in not written down) practices points to a move from trust-based to contract-based industrial relations – what matters is what is written down in agreements. This aligns with what Olav explained earlier – how, in the old regime, managers could often be recruited internally, by "working your way up from the shop floor", meaning that workers and managers often would have worked together for quite some time, creating ample opportunity for the building of trust on the basis of interaction and identification. With managers coming from other firms, there would be less previous interaction and hence, less trust, leaving the new authority to depend on transactional contracts to mobilize effort.

Eileen Applebaum suggests that this change, from implicit contracts and trust to formal contracts, is not only a matter of the management style of certain CEOs, but rather a general feature of a specific type of financialization, namely private-equity ownership (Appelbaum et al. 2013). In order to reach their goals of increasing shareholder value, private equity owners restructure firms, disregarding informal agreements that will not necessarily affect share value in the short run. While trust between executives and trade unions might be important for long-term productivity, it is not necessarily important for short-term shareholder value. While Applebaum et al.'s research is based on case studies of four firms bought by private equity firms in the US and UK, it also highlights the relation between the change at Safe, from informal to explicit

agreements, and the changed form of ownership. While the CEO says that the union will "have a good hand" in the upcoming negotiations if they agree to overtime, this appeal to good faith is not sufficient to secure commitment, and a monetary bonus for overtime is what secures workers' willingness to work overtime.

Grievances with the new regime were not limited to the question of wages or bonuses. There were also concerns that the new authorities were not investing in the competence of workers for the long term:

> Field diary: During a quiet spell in Final Assembly, Odin tells me about the [specific type of component in products], and how they cooperate a lot with German firms to get it done. Odin has tried to set up courses with the Germans for the employees in Final Assembly, but management says no. "You don't really know how to do this?" the Germans asked him at one point, and he had to concede that they were correct. "I think we are in danger of getting a frayed reputation," he says with a look of concern on his face.

Thus, the grievances against management are also connected to concerns about what is the best course of action for Safe in the long run, and Odin worries that their reputation as a high-quality producer might be in danger.

> Odin: There is a lot of discontent here. The building is slowly decaying. Deviations [from EHS] are not dealt with.

There were various grievances towards management and especially the new regime on the shop floor. The main one, however, had to do with what workers saw as an increase in the use of temporary labor.

Temporary Workers as a Source of Conflict

As demonstrated in the previous chapter, temporary workers were an integral part of production at Safe. The systematic hiring of temps was also a source of conflict between the trade union and Safe's executives. As some migrants had opted to get a regular position with Safe, the categories of migrant workers and temporary workers overlapped to some extent, but not completely. While the Norwegians usually talked

about the migrant workers as one group, they made sure to underline that it was the nature of the migrants' employment (temporary) that was a problem, not that they were migrants. The use of temporary labor was controversial and led to disagreements, both between the trade union and management, and within the trade union itself. And while temporary labor had roots going back to the 1980s at Safe, there was a sense on the shop floor that it had increased with the new authorities. There was also a feeling that the increase of temps in recent years had weakened the strength of the trade union by making industrial action less effective.

My fieldwork took place during central negotiations between LO[58] and NHO[59], and there was a chance that the unionized workers at Safe would have to join a nationwide strike initiated by the United Federation of Trade Unions [Fellesforbundet] if negotiations broke down. While hanging around in Final Assembly, the radio news talked about the possibility of a national strike and how this would affect firms in Storesand. I wondered how this would affect the already stretched timetables for the critical reorientation projects:

> Olav: If there is a strike here, only the organized stop working, so the people not organized will keep production going.
>
> Me: Can they make a product from beginning to end?
>
> Olav: Probably. The warehouse is the most critical place, everyone there is still organized. But in Fabrication and Final Assembly production could go on with unorganized workers. For a while at least.
>
> Olaf: The Eastern Europeans rarely have certificates for forklifts or lifts, I wonder what would happen if a strike controller came by to check.

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[58] The largest trade-union umbrella organization in Norway: Norwegian Confederation of Trade Unions.
[59] Largest employer organization: The Confederation of Norwegian Enterprise.

Olav: 15 years ago, we had a go-slow action, and that one was successful. But everyone was organized back then, we were able to hit the company in a completely different way than today.

Olav was skeptical that the union at Safe could win this time around if there was a serious labor conflict. While Olav was worried the union was losing its power to halt production, others had lost faith in the effectiveness of being organized at all. The next excerpt is also in the context of national negotiations and the possibility of a nationwide strike:

Oliver: [reading e-mail from the United Federation of Trade Unions [Fellesforbundet]] Have you seen this? The unorganized will continue working if we have to participate in the [national] strike.

Ommund the shop steward: That will be disastrous for the projects that are supposed to be done by June. There is nothing much we can do about it though, that is just how it is.

Oliver: We can quit the union.

[They discuss a little back and forth whether they can continue producing if all the unionized workers go on strike. Most Norwegians are in the union, but most migrant workers are not, they agree]

Ommund, the shop steward in the warehouse, senses that his fellow workers might not be too eager to be commanded to join a strike, as Safe is already seriously behind schedule. He therefore tries to structure the story of the strike as an unavoidable occurrence, outside of the realm that one can do anything about. Oliver, however, voices his discontent with the union by suggesting that they should just quit the union. Whether the union would be capable of halting production if they actually went on strike is a question without a clear answer. In addition, the conversation points to the significance of having two groups of workers, one unionized and Norwegian, the other non-unionized migrant workers, with little interaction and identification between them. If a strike had been ordered at Safe there would have been two possible outcomes. Either unionized and mostly Norwegian workers would have managed to

bring production to a halt, which would have led to migrant workers being laid off with no pay, or migrant workers would have kept production going by working overtime, while regular employees were on strike. In either case, there is little reason to believe the outcome would have increased interaction, identification and trust between the two groups of workers. Industrial action along these lines might instead have led to increased tension between the two groups of workers. Hence, it is almost as if there are now three sides, not two, to taking industrial action: capital, regular workers, and migrant workers. Systematic numerical flexibility and migrant workers seem, then, to have fundamentally altered the conditions for industrial actions at Safe.

Environment, health and security issues and temporary labor was also a concern on the shop floor. This excerpt from the field diary illustrates how EHS practices at Safe Manufacturing are held up against the formal EHS rules in Norwegian working life, and how Safe is designated as a place where things have been allowed to slide somewhat.

> Field diary: We are sitting in the break room, which also functions as the office of the leading workers. Most workers are here, as it is soon 1500. A guy from another firm who is here to fix something with the ventilation talks about particles in the air from the filter in the painting hall, and how dangerous it is to inhale it. They start talking about how the Eastern Europeans don't use masks in Fabrication, and how dangerous that is. The external guy says that is something he reacts to when he comes by. A guy from the warehouse talks about how disgusting the filter in his own mask was when he took it out to rinse it.

> Ole-Johan: The health and safety representative tells them to put it on, but they don't listen. Then it is not much we can do.

> External guy: Then they cannot work here. It is as simple as that.

> Ole-Johan: Well, yes, I guess you are right.

The external service technician talks about the dangers of not wearing the mask, and how he reacts to the unsafe practices among the workers in Fabrication, where the majority are migrants. Ole-Johan feels a need to defend Safe from these accusations

of allowing dangerous practices and states that they have been told, but will not listen. This makes the external guy escalate his criticism by invoking the formal rules for safe conduct, and what consequences any breach of them should have. Ole-Johan has to concede this point, having only achieved an intensification of the criticism. What was a discussion about the lax EHS practices of the migrant workers, concludes that people who don't follow the EHS rules not being able to work at Safe, implying that it is the task of the trade union or EHS representative to enforce these rules. Thus, Ole-Johan's intervention ends up underlining the inability of the trade union to enforce EHS rules. As we shall see later, the failure of the trade union in making itself heard at the executive level was a source of conflict within the union itself.

The View from the Executive Offices

The executives at Safe were located in the administration building overlooking the production facilities. Here, talk was not about dichotomies such as the old and new authority, but of issues connected to the new strategy of reorientation. Mons, a member of the executive group, saw the process of reorientation as the main cause of worker discontent.

> Me: But does this mean that the critical competitive advantage at Safe is more about immaterial things, such as patents, certifications, knowledge of the NORSOK and such things, or is the competence the most critical?
>
> Mons: Yes, well…we are a…we are still in a process of extreme adjustment. I don't know who you have been talking to and what input you have from the boys down there [in production]. But they might be a little bit behind on parts of the adjustment process. So we try to bring them with us at every step. [..]

First I thought Mons's failure to answer my question was a misunderstanding. During analysis however, I came to see his response as being triggered by the framing of the question, particularly the dichotomy between the immaterial resources and the embodied competence, and asking him what was the most important might have made the question seem more of an accusation from the shop floor than was my intention.

Competence was the main argument of the trade union in discussions regarding the hiring of temporary or regular workers. While I wondered whether the embodied knowledge of workers or the patents and certificates were the most critical input, Mons might have heard something to the effect of: "Do you think the knowledge of workers is important at all?" In this interpretation Mons's defensive answer makes sense, and he tries to explain why I might have met so many critical voices during my time in production. According to Mons, who is the executive linking production with the rest of executive leadership, the adjustment process is the cause of discontent, especially the workers' lack of understanding of what is going on. What he refers to as "the adjustment process" is the expression of the strategy of reorientation on the shop floor. According to Mons, not only was the shop floor lagging behind in the understanding of adjustment, the process itself was increasing tension and conflict:

> Me: In a perfect world, it would have been interesting to also go to [name of another production site also owned by Safe] and do fieldwork there.

> Mons: Yes, the perfect world…you know, a lot of the tension here, I don't want to say conflicts, but tensions between….it is because I'm standing here to perform a task, I cannot do that, because I am dependent on someone else who is somewhere else, who hasn't really told me what to do, and now I cannot get a hold of him.

This problem of communication and lack of information was a continuous problem in production, according to Mons.

> Mons: You have this dynamic all the time, and you need to steer it and solve the problems in due order. And that is my most important job here, to keep production going at all times. People should come to work and feel that they have an opportunity to do their job. When people have to do other things, like sweeping the floor, because they're waiting for a blueprint or some information, that causes frustration. So that is my goal: to keep production going.

The causes of such stoppages were for the most part external ones, according to Mons:

Mons: We have a system for deviation reports, and procedures for stop and wait, and we have discussions on these issues in the executive group. But the root cause is mostly the same, it is back to what I say....

Me: External?

Mons: Yes, external issues, things that needs to be sorted. [..] A lot of stuff happens in an environment such as this. We thought that some supplier was coming through, then suddenly he does not, so whoops...

Thus, the way the current state of affairs in the relation between the shop floor and the executive group was made sense of among executives, was as an unfortunate, but unsurprising side effect of reorientation. Real disagreements between trade union and executives over temps, wages, or firm development were not the primary causes of tension. Instead, conflict and frustration were caused by the new strategy, and would probably blow over when things fell in to place, in Mons's view.

Workers and executives gave different descriptions of the relation between them. Workers emphasized the differences between the new and old regime in terms of an increased use of temporary workers and breaches of informal agreements. Executives acknowledged that there was tension (but did not want to call it conflict) over several issues related to the "extreme adjustment" process that the strategy of reorientation entailed for the shop floor. The implementation of reorientation, then, was experienced differently by executives and workers: as solvable start-up problems by the former, and as a new authority coming down hard on the shop floor by the latter.

A Quarrel over Trade Union Policy

The trade union at Safe found itself in a position where the use of temps had increased while, at the same time, the union had not succeeded in halting this development. And while discontent with the new regime was widespread, the union was far from unified over which strategy to follow or course of action to take. This episode took place in the same week as the general assembly of the trade union at Safe, so trade union matters were a frequent topic:

Field diary: Ole comes in and asks me whether workers are organized in the other firms I have been doing research in. Sensing that the question is not only made for curiosity's sake, I try to pick my words carefully, and answer that I have only been in the process industry, but where I was it was close to 100 percent union membership.

Ole then follows up by turning to Odin and saying something about how important it is that everyone pulls together if the union is to achieve anything at all. This starts a heated exchange between Ole and Odin regarding Odin's refusal to rejoin the union after he left it a few years ago over a disagreement. Oddvar starts a conversation with me, either because he feels this exchange is something I should not be witness to because it concerns internal trade union matters, or because he thinks it embarrassing that Ole and Odin have such an intense argument in front of an outsider. I still manage to catch the gist of the argument:

Odin: I cannot afford to be part of some club[60] just for fun. They have to confront the executives when they hire temps and do things outside of the law. What if there is an accident when they work illegally, then it is the CEO's responsibility?!

Ole argues that they have to back up the current leader of the union, Ommund, instead of quitting on him.

Odin is irritated and says the union is acting far too weakly in the face of management.

Ole says Odin sounds just like Ole-Johan, who I assume is known to complain about the trade union.

Odin counters and yells that Ole sounds just like the CEO.

I later learn that Odin thinks the current leader of the trade union is too weak, and has stated that he will only join the union if Olav [the trade unionist] becomes leader.

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[60] In Norwegian, calling the union "some club" was here meant in a derogatory way, implying that the union at Safe is not a real union because it cannot do what a union does: fight for members' interests.

Odin refuses to be a member of the union because the union fails to stand up against executives. The exchange also shows how this question is not only debated by Ole and Odin. Other names are invoked in the debate, such as Ole-Johan, who is used as an example of someone who is overly skeptical of the union's efforts. The quarrel shows how the union members struggle to find a unified course of action, and risk being caught in a vicious circle: As its strength diminishes, it is less able to force its will. As it is less effective, members lose faith, and choose to quit the union, weakening it even more.

The Role of the Trade Union

Standing up to executives on issues such as temps and wages was understood to be amongst the union's primary duties. When it came to the competitive situation of Safe Manufacturing however, the priorities were not as clear. In a conversation with Olav, we discussed how the knowledge of workers was used for competitive advantage:

> At the end of the day I talk with Olav about the knowledge of the workers and how it is utilized. After learning that the system for deviations does not work very well, I am curious about how the knowledge from the shop floor is used to improve the production process. Olav explains that the trade union has taken up a number of issues with management, but he states that he doesn't think these questions are part of the responsibility of the trade union.

In giving input on matters of efficiency and competitiveness, Olav feels the union is taking on a larger responsibility than it should, implying that questions that are related to efficiency of production, or Lysgaard's technical-rational system (2011), are outside of the union's core duties. An interview with Mads, the former union activist and also former employee representative on the board, illuminates another aspect of this way of thinking:

> Me: You mentioned earlier that the employees got a representative on the board?

> Mads: I felt we needed that, because basically we had felt cheated for a long time. When we got an employee on the board, we saw how things really were. There was no way to hide information from us anymore.

Mads was central when employees[61] demanded representation on the board of Safe Manufacturing. He became the first employee representative, a position now held by one of the lower-level managers.

> Me: Being the employee representative, you basically have the same information as the chairman and owner?
>
> Mads: Yes.
>
> Me: So the union is in a better position for wage negotiations and such things?
>
> Mads: Well…you could say I was confronted by my earlier opinions[62], because when I was the leader of the trade union, I was the employee representative at the same time. But there are things in the board meetings that you have to keep your mouth shut about, due to confidentiality. And at the same time, you are negotiating wages and these things. So I had to let the trade union know, that we must not combine the roles of leader and employee rep. It only makes it harder to do the roles well.

In order to be able to fight for increased wages, then, Mads argues that knowledge can actually be too much of a good thing. Knowing Safe's financial situation might actually make it harder to fight for higher wages. The solution was to move the decision regarding wages out of the board:

> Mads: What they have done now is that two of the board members, usually the CEO and the chairman, go and discuss how much money can be negotiated over

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[61] Here, *employees* is used as the representative on the board represents all employees, not only the shop-floor *workers*. The demand for board representation is issued by employees, not the trade union.

[62] Untranslatable Norwegian expression, "å møte seg selv i døra", literally: to meet oneself in the doorway. An expression that is used when someone does something that stands in contrast to earlier held opinions. For example, someone who says working out is vanity, and then starts working out, might "meet himself in the doorway".

in the local wage negotiations. It is not discussed in the board itself, and that is perfectly fine…

According to Mads, this was a better way to do it because having full knowledge of Safe's situation would mean that it became harder to put forward demands for wage increases. Hence, the role of fighting for wages should be kept separate:

> Mads: It was a hard year that year, we were negotiating [wages] and at the same time I had a lot of information, but I could not say anything. And meanwhile I was supposed to defend all these demands from the union.
>
> Me: You were between a rock and a hard place?
>
> Mads: It was bollocks [*bare tull*]. Still, having a representative on the board, that was exactly what we needed. It was an advantage for the union. In the beginning, hardly anyone saw the point, but now that we have [name of new rep] who says the same as me, I think more people will see the use of it.

Insight into the financial situation of the firm, along with an obligation to put forward members' demands for wage increases, placed Mads in a contradictory position. Mads and the union solved it by actively avoiding knowledge of certain issues, such as how much money could be negotiated over for wage increases. Another way to do it could have been to adjust the demands in accordance with the new knowledge, but instead a policy of knowing less was chosen, allowing the union more leeway in raising wage demands. Hence, putting forward members' demands for increasing wages was deemed the primary role of the union. When combined with the view of Olav above, of technical-rational problems as being outside of the union's responsibility, a picture emerges of a union that is concerned with fighting for its members' interests while leaving the running of the firm to the executives.

Michael Burawoy's (1985) concept of *despotic hegemony* states that the mobility of capital disciplines workers by aligning the interests of the two. If capital can find higher profits elsewhere, production will move and jobs be lost. The need for the "whip of the foreman" is removed as workers have to willingly forego demands for wages or else risk losing their jobs due to capital flight. This despotic hegemony, of course, depends

on workers acknowledging the threat of capital flight. In this light, the abstention from full knowledge by Mads and the union at Safe can be understood as a way to protect the [independence] of the union from being compelled by the economic logic discussed in board meetings. Instead of fighting for their members' interests on unfamiliar terrain (that of business economics), the union chose a course of action whereby it limited its knowledge in order to raise maximal wage demands on behalf of its members. In doing so, they also avoid the discipline that follows from insight into the needs of capital, and the despotic hegemony of capital cannot be established.

Industrial Relations Characterized by Conflict

Industrial relations at Safe Manufacturing were characterized by several conflicts, with the use of temporary workers being the most prominent. The level of discontent had risen under the new authority, which most workers saw as less forthcoming to workers' concerns than the previous group of executives. Informal understandings between the trade union and the old authority were being revoked in favor of formal agreements, a practice typical of private-equity takeovers (Applebaum et al. 2013). Consent and commitment to extra efforts from workers were secured on a pro quid pro basis rather than by appeals to a common interest or greater good. Industrial relations at Safe are described well by Erik Olin Wright's concept of a *negative class compromise* (2015): a conception of industrial relations as a zero-sum game, but where the actors do not have much to gain by further conflict, because neither is strong enough to force their will. Instead, concessions are given by both sides, but without the mutual cooperation that characterizes a positive class compromise, where cooperation is seen to have positive consequences for both sides. Furthermore, the *associational power* (Olin Wright 2015) – the numerical strength – of the union was weakened due to its inability to stand up to management and the lack of success in organizing temporary workers.

The conflict at Safe was described in different ways among executives and on the shop floor. Executives saw discontent among workers as a result of a lack of knowledge on the strategy of reorientation and the changes it entailed. On the shop floor, these

changes were understood as examples of how the "new authority" was going forward without listening to workers. Hence, there was no common ground where one could agree on firm development, as there was no common understanding of what the main problem was. In addition, the union at Safe did not see it as a part of their role to take responsibility for Safe's competitiveness. This should be understood in the context of the interpellation taking place in the labor process, where workers were expected to be told what to do, while the managerial bureaucracy took responsibility for coordination of production. Instead of cooperation for firm development, the trade union was busy fighting one aspect of firm development as envisaged by executives – the use of temporary workers to keep fixed costs down. The differing views between the executives and the shop floor meant that there was no common narrative on which cooperation could be grounded. As I now will go on to show, this stands in contrast to the situation at Metal, where cooperation for the common good was the dominant narrative.

Metal Industries: Hegemonic Cooperation

"Because wages in Norway are high, and we have to make up for that in efficiency."

Top level manager

"No one is to lose their job"

Trade union representative

The relation between the trade union and executives at Metal Industries was characterized by cooperation. This cooperation was embedded in a common understanding of what Metal was like, and from this, a shared understanding of a common interest. Metal Industries was, like Safe, a member of *Norwegian Industry* and the *Confederation for Norwegian Enterprise*. Shop-floor workers were organized in *Industry and Energy*, part of the *Norwegian Confederation of Trade Unions* [LO]. The organization of the labor process and robotization (chapters five and six) became important for my understanding of class cooperation at Metal. Unlike at Safe, where

the effects of interpellation induced by simple control and use of temporary labor were detrimental for cooperation, at Metal the opposite was the case. Operators' responsibility for production informed the trade union's view of their role in ensuring firm competitiveness. At Safe the form of development (temporary labor) made cooperation difficult. At Metal, the form of development (robotization) was made easier to implement due to cooperation.

A Class Compromise

The cooperation between the trade union and Metal was based on an understanding that no one was to lose their job due to robotization or other types of effectivization. In return, the union had agreed to support both robotization and other measures aimed at effectivization. Terje the shop steward[63] explained the union's point of view:

> Terje: The most important thing in a project like this is the premise that no one is to lose their job as a consequence of it. They [people who are made redundant] shall be taken care of. Either you get another job where there is an opening, or people are offered retirement packages. People need to see that if their task is taken over by a robot, that their employment will not be in jeopardy. If they fear for their job, why would they participate in a robotization project? OK, the total number of jobs at Metal might be reduced, but as long as it is done by voluntarily retirement, that is OK as far as we are concerned.
>
> Me: So you are confident that this will be the case [that no one loses their job]?
>
> Terje: Yes, yes. That has been the case all along. With the latest automatizations, we wrote a formal agreement to that effect, with specific guidelines about what happens if there is redundancy. [..] You have to do these things [robotization] in such a way that people's jobs are safe.

This understanding extended to Metal's work with continuous improvement. Gains in productivity should be realized either by voluntarily retirement or by finding a new job for redundant operators within the firm. These were the expectations of the trade

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[63] Shop steward is used here instead of trade unionist because Terje held a formal position in the union.

union toward management's handling of robotization and effectivization. In return, executives also had clear expectations of the trade union:

> Daniel the executive: We expect the trade union representatives to contribute to the strategic goals of the company, because that is in everybody's interest. While robotization does lead to the loss of some jobs, the trade union has supported it because we want Metal to survive here for 100 more years, and we know, being a small smelter, as we are, globally speaking, we need to be the most productive smelter. Because wages in Norway are high, and we have to make up for that in efficiency.

Class cooperation, however, did not mean that the union and executives at Metal agreed on everything. Nor did it mean that compromise flowed from the good will of labor-market parties. The compromise at Metal should be understood in light of the relative strength of the parties vis à vis each other. This is exemplified in two ways: the union's strategy to maintain a high level of unionization, and the access of management to detailed information of the performance of tasks in production by digital means.

Two Ways to Maintain One's Bargaining Position

Close to 100 percent of operators were members of the trade union. The workforce consisted of operators with regular employment working shifts (for the most part), as well as a pool of temps who could be called in when people were sick or on leave. Starting out in the temp pool was a typical path to regular employment at Metal. The trade union had succeeded in establishing a rule that unionized temps should be preferred when hiring from the pool of temps. The consequence of this was that temps who sought a regular position at Metal had a clear interest in joining Industry and Energy. In this way, what Erik Olin Wright calls the associational strength of the union was maintained (Wright 2015).

Earlier, temporary workers had been brought in to perform regular tasks. At the time of my fieldwork, this practice had ended.

Me: Have you considered hiring temporary workers?

Magnus the manager: We have discussed it, yes, but we didn't do it on a systematic basis. I believe that the trade union…they are quite clear on what they think about it. We know what they think of such things. I don't think anyone [of the managers] here sees any point in trying to introduce that [temps] here, it is not worth the effort. We have a system now that works [with a pool of regular temps] so let's go forward with that.

Thus, while relations between executives and the trade union was primarily characterized by cooperation and trust, the union at the same time looked to preserve its associational strength by signaling that the systematic use of temporary workers was off the table.

My fieldwork at Metal took place at the same time as negotiations over the implementation of AGVs in production. The crux of the disagreement was the question of how much labor was saved by their implementation. To answer this question, one would need to have very specific knowledge of tasks in certain production areas. As the immediate responsibility for production was for the most part left to the unsupervised teams, I started to wonder whether the union would not have a decisive advantage in negotiations, since they would have much more intimate knowledge of production than management. Max, one of the team leaders involved in the implementation of AGVs, explained why this was not necessarily the case.

Me: But isn't it also a question of how many people you need for each task when robots are introduced?

Max: Yes, but that is what I say, the trade union comes in, we have a good dialogue, and end up with a common agreement, how to organize in the best way when you take away one man.

Me: But if the operators run the process almost by themselves, they will have very extensive knowledge on how much time each operation takes after robotization, so I assume they have a strong hand in those negotiations. But what cards do management have, really?

Max: Well, [chuckles]. As I say, we discuss down to a common agreement [...] when you put an oven in hand [a specific operation] or coal-change [specific operation], it gets registered in [name of digital system for surveillance of production], so we have the time they spend for different operations, we have documentation.

Me: So there is a right answer [*fasit*] to the question of how much time an operation takes?

Max: Yes there is. But it is dangerous to use our right answer as the only right answer. We have an idea about how long a certain task takes, and then operators might have a completely different view. So in the end, you have to reach some sort of common ground.

Me: So you are not at the mercy of operators because they have all the knowledge?

Max: No, we also have the knowledge, even though they do the job. That's how it is.

The software keeping track of production provided managers with relevant knowledge on how much time different tasks took, and in that way, allowed them to hold their own in negotiations with the union over labor time spent on specific tasks.

Careers at Metal Industries

Among both managers and operators, there was a prevalence of people with long careers at Metal. For many, the majority or even the entirety of their working years had been at Metal. Younger operators also expressed their desire to stay at Metal. Most agreed that there were no better places to work nearby, and dreaded the prospect of a closure[64]. Oddgeir, an operator in his 30s, found the prospect of going to the closest industrial town, Storevik, ridiculous.

Oddgeir: Yes, I like it, I will probably stay here.

Me: There are no similar jobs nearby?

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[64] See also quote from Ole-Martin, p.172

Oddgeir: No I guess you would have to go closer to [Western Norwegian city]

Me: What about Storevik?

Oddgeir: The Storevik smelter? Is that still operational? No, I will never go to Storevik [laughs].

There were also opportunities for career advancement at Metal, either by becoming a team leader and becoming one of the "daytime" people, or through the trade union, which had provided several high-level managers for Metal over the years. The high proportion of managers with experience from the shop floor was seen as an advantage by operators and managers. Still, becoming a manager through the trade union was controversial. Truls the shop steward argued that this was misunderstood:

> For some people, when you go through this door [door to the trade union office], they immediately accuse you of doing it because you want to become a manager. The way I see it: if management think former trade unionists can become managers, it is because they have done a good job as representatives. If you have only sucked up to management while you represented the union, I don't think executives will see much potential. But if you have shown yourself a worthy adversary, fighting for your members with knowledge and wisdom [...] I think they could look to hire you later on. We shop stewards know this game, we are not here to raise hell for Metal. We are to serve our members, but also to help the company.

There were, however, signs that the recruitment of managers from the shop floor was declining:

> Mark the manager: Before, the policy was to help skilled operators take the step to become managers, but after a while we realized that there were too few with an academic background. You need someone who has studied and gone to college. We have great operators and technicians, but you need some academics too. So now we also look for people with formal competence [above letter of apprentice].

Oda the operator had seen this change from the shop floor:

> Before, most managers had started on the shop floor. Hard-working operators became managers. Nowadays papers [formal education] count more, so managers are increasingly recruited from elsewhere. [..] But of course, whether outsiders will survive and thrive in this place, that is a different matter.

Traditionally, there had been opportunities for operators to become managers and work their way upwards from the shop floor if they desired. There was labor mobility at Metal, both along a horizontal and a vertical axis. One could say that mobility was perhaps greater internally than externally. Operators and managers could change jobs within Metal in Lillevik, but fewer seemed to have a desire to work elsewhere. Leaving Metal would also mean entering another work context, where the skills and know-how from Metal were of lesser value. Thus, the plant-specific knowledge of both operators and managers might be another reason for the long careers at the smelter. Whether the reason was lack of opportunities elsewhere or a desire to stay at Metal, a consequence of the long careers of operators and managers was having the time to build trust between operators and management through processes of interaction and identification (see chapter five for examples). The long-term commitment to Metal of operators and managers, as well as the relative strength of the trade union, should be understood as aspects of the class compromise. More important however, was the narrative shared by operators, managers and executives of what Metal was and should be. A cornerstone in this narrative was the way the labor process was organized at Metal.

A Flat Structure – Metal Industries' Story of Itself

"We succeed here because we are not afraid to call each other an asshole."

Operator

Narratives that make sense of people, organizations, and their place in the world are often complex and hard to summarize in a few sentences. The above quote, however, points in the general direction: Metal Industries was successful because operators

were allowed to speak their mind and freely criticize each other. Both operators and managers stressed that it was acceptable to make a mistake, but unacceptable to conceal it. Operators not only spoke their minds freely, they also acted on their own when problems arose (see quote from executive on reaction times, p. 150). These ideas were connected to the organizational structure at Metal in Lillevik, which was usually among the first things that was brought up in discussions about Metal and how it compared to other smelters. The removal of foremen from the teams and the fact that operators ran production themselves was seen as evidence of the flat structure. This organizational model was often juxtaposed with the hierarchical organization of Metal Corporation's smelters in other countries, where "managers gush out everywhere" as one operator put it. Metal Industries in Lillevik saw itself as a "flat organization", different from top-down hierarchical organizations where managers told everyone what to do.

> Oddgeir: In other countries they have supervisors who watch over people and what they do. Tasks are often narrow and specialized. Here in Norway, workers have broad knowledge, and are trusted with a broad range of tasks.

In Metal Industries' narrative of itself, however, a flat structure was not the only characteristic differentiating them from other companies.

Metal Industries was often contrasted with the former state-owned factory in the neighboring town of Storevik. Trond, a former operator and shop steward, explained:

> We've always been privately owned you know. And if business was bad, we couldn't just run to the government [*han stat*[65]] and get money. We had to make the money first. That was the lesson I was taught when I became a shop steward. The money needs to be made before you start to demand higher wages. We looked to [name of factory in Storevik], they were always paid higher wages than us, but they didn't make any money. They ran to the government when business

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[65] Interestingly, Trond talks about the state as being a man, and here, some kind of patriarchal figure to whom one can run when in trouble. Not so for the people at Metal in Lillevik – being privately owned by international capital, they have to figure out how to make money, or risk being closed down.

was bad, and were handed subsidies. We were really irritated about that. But we kept focus on doing the best job we could, so we could sell our products. I guess it was an impetus [*drivkraft*] for us, we had to be the best in order to compete.

In other words, at Metal Industries in Lillevik the distance from the shop floor to executives was short. In addition, Metal was a successful competitor in global capitalism, not needing handouts from the government. These ideas were common both among managers and operators.

Another important element in the story was the excellence of operations at Metal. During my first day in the Casting Hall, the manager welcomed me with the words: "You are now in one of the best aluminum smelters in the world". I also learned that Metal was the only smelter in the world who could make a specific type of metal slab, which was a source of pride. Moreover, I was explained that they were able to do this because workers were knowledgeable about the casting process. Hence, not only was there a flat structure and success in competition; the former was the cause of the latter. As Ole-Petter the operator, a key informant, told me during my last day in the Casting Hall: "I think it works well here because operators are listened to". Thus, the flat structure and being the best smelter in the world were two sides of the same coin, rather than two isolated ideas about what characterized Metal. Metal was not only a good place to work with a flat structure and excellence in competition; it excelled in competition precisely because it was a good place to work with a flat structure. Job quality and efficiency went hand in hand. This, of course, is not an idea unique to Metal Industries in Lillevik, but an integral component in the socio-technical systems-inspired idea of a Norwegian cooperative model, where influence over work is an integral part of competitive advantage.

As demonstrated in chapter four with the Lean day, the narrative of what was going on at Metal was not all fun and games. Dark skies were on the horizon: increasing aluminum production in China, less favorable contracts for electricity, and competition from low-cost countries. The solution to this was the strategy of cost-cutting. And for

the trade union at Metal, it was natural to participate in Metal's efforts to improve competitiveness. As I will show, this participation was understood in light of past experiences of the union's decisive role in a critical technology choice.

Understanding the Present by Drawing on the Past

In the late 1970s and early 1980s, several changes took place at Metal in Lillevik. The seeds of a new way of organizing work were planted, and there was a change in the attitude of the trade union towards cooperation for firm development. Both of these changes were related to the introduction of new smelting technology in Lillevik. The question for executives and trade union was which technology to use out of Alphamelt[66] and Betamelt. Alphamelt was the most radical change, a new way to build ovens that reduced emissions and smoke in the smelter halls. It required less manpower to run, but was more expensive. Betamelt was the moderate change, an improvement to the existing technology. It was cheaper, required more people to operate, but also meant continued smoke and emissions in the production halls. While Metal Corporation (the global corporation of which Metal Industries was a part) did not have a clear preference between the two, and might even have leaned slightly towards Betamelt, the trade union was clear that they wanted Alphamelt, even though this would mean fewer jobs at the smelter. A shop steward remembered it this way:

> Trond: The owners [Metal] preferred Betamelt, but we [trade union] saw that Alphamelt would give a much better working environment. So in spite of the reduced number of jobs it entailed, we went for Alphamelt, in quite a decisive way I must say. This was not popular in the local paper, who almost painted us as traitors because we chose the technology that meant fewer jobs. [..] But as we saw it, Alphamelt was the technology of the future, it was necessary to secure continued operations in Lillevik. At the same time, it was on the cards that we had to save money to justify such a big investment.

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[66] Technology anonymized

Another former trade union representative from the period complements the picture:

> Tim: It [the good relation between union and management] was very important for getting the smelter modernized. And it was important with regards to the choice of technology. The union decided at the annual meeting (where all members vote) to say to management that we would accept a reduction of 100 jobs in order to secure Alphamelt for Lillevik. I don't think that happens very often, that members vote *for* job reductions. [..] But we were scared to death by the prospect of Betamelt here. We didn't see any future in it. It was I think, and the paper also said, that it was the union that was the deciding factor in the choice of technology that time.

What these quotes amply illustrate is how the continued operations of the smelter in Lillevik was the main goal of the trade union. Even if people would be made redundant to secure it. There is a strong element of path dependency in technological choices like the one between Alphamelt and Betamelt: what you chose now has consequences for what you can choose in the future. Old-timers at Metal, both operators and managers, saw the choice of Alphamelt as decisive for the subsequent development of Metal in Lillevik. The willingness of the union to put jobs on the line to secure investments, as they had done with Alphamelt, was thus an entrenched part of trade union common sense at Metal in Lillevik.

The contemporary trade unionists at Metal echoed the reasoning behind the decision to go for Alphamelt when talking about contemporary projects:

> Martin: We [Metal and workers] are completely dependent on each other. [..] At [name of company he visited] I talked to the leader of the union, he bragged about having saved all the jobs there. Not a single person had lost their job during the last ten years he told me. How is the production going then, I asked him. Production has been halved, he said.
>
> Me: OK, how is that sustainable?
>
> Martin: Well, it isn't. There is a reason that [name of firm] is now outsourcing production to Poland and closing factories in Norway. If you as a trade unionist

think that you have reached your goal if you maintain the level of employment, then you have misunderstood everything.

The primary concern of the union, then, was to contribute to the continued competitiveness at Metal, not to maintain the current level of employment at all costs. The historical narrative of the importance of the union in securing Alphamelt thus served to justify today's cooperation for firm development in the form of robotization. The decision back then to accept job reductions in order to secure Alphamelt was understood to have secured the trajectory of Metal towards its current position. Hence, the story of Alphamelt provided an interpretative frame within which to understand robotization.

Roots of Participation

The implementation of Alphamelt also heralded the beginning of mobilization of operator knowledge for improving the production process. During its implementation, operators were given space to find out how best to operate the new technology and formulate procedures in cooperation with management, in the so-called *Alpha Project*. Thus, the choice of technology was connected to the development of work organization in the direction of participation in incremental process innovation. Trond, a shop steward, remembers:

> Trond: Since Alphamelt was more expensive, it was on the cards that we had to make more money to justify the investment. And that was the start of the Alpha Project. It was rooted in the Basic agreement Part B, describing how cooperation [between firm and workers/trade union] should be organized. This was quite cutting edge at the time [*nybrottsarbeid*] [..] We started with one small section, but when management saw that it worked, the project was expanded to the entire smelter.

> Me: And it is the investment in Alphamelt that pushes this to the fore?

> Trond: Yes, Alphamelt pushed participation and cooperation to the fore, you can say that. And then we saw that there was a need to upgrade the skills of the operators, they had to understand why they were doing the various tasks that they were doing.

The processes of technology implementation and operator involvement (in process innovation) were intertwined. These changes at Metal took place during the period in which negotiations between LO and NAF (NHO) finalized the *Agreement on Development* (see chapter two). At Metal, this period also brought changes in the relation between Metal and the trade union.

In the 1980s the trade union started to show greater concern for the technical-rational goals at Metal, showing greater concern for questions regarding profitability and competitive advantage. Over coffee, retired managers Martin and Michael explain the change in industrial relations going on in this period, as seen from the management side:

> Martin: The old guard, they had been shop stewards for a long while, we had a particular forceful [*bastant*] guy from the old school. He came from the smelter in Storevik, and I don't think that was the best…

> Michael: It was a hard environment at the Storevik smelter in those years, sharp divisions between the firm and the union.

> Martin: He brought that way of thinking with him when he became a shop steward here. He was not a guy who was open to new ideas, to put it mildly. So during those days, it was hard to get acceptance for new ideas on leadership and codetermination [*medbestemmelse*], or rather, co-influence [*medinnflytelse*] I would say. We don't need to go as far as saying codetermination yet. That was later.

> Michael: The union was an adversary, plain and simple.

> Martin: Their notion of cooperation was limited to negotiations of wages, and negotiations that, shall we say, first and foremost were about their own interests. The world is completely different today of course. Now I feel that employees and management unite over a common goal: to get the company to do as well as possible, to achieve a good result.

From the trade union side of things, the context of the changes was seen in a different light. But the narrative told by shop stewards also pointed to a change in industrial

relations in this period. During fieldwork, I was given a book[67] on Metal released for an earlier anniversary. I discussed some of its descriptions of industrial relations with Terje the shop steward and old-timer at Metal.

> Me: I read the book you gave me, where the author describes how the union started to take a greater responsibility for production during the 1980s. What do you think about the description there of how things went down?
>
> Terje[68]: I think it is a fair description, it was before my time of course, but it matches the story as I have read [we have just talked about him reading old protocols from trade union meetings and negotiations] and heard about it. I would say that until the 1980s, there was a constant struggle for what we consider trifles today. Protective equipment, gloves, glasses and such things involved struggle back then. But now that job has been done, these things are taken for granted. The first time the trade union really intervened in bigger matters regarding production was with the choice of Alphamelt.

The choice of Alphamelt signaled a change in industrial relations from a focus on getting concessions from Metal to cooperation for profitability. The change in trade-union policy was intertwined in changes in the organization of the labor process, towards more reliance on operator knowledge and increased delegation of responsibility, a process reaching its apex two decades later with the removal of the foremen from the teams.

A common view on the relation between management and trade union at Metal was often expressed with phrases such as "we have the same goal, but might have different ideas on how to get there." I have demonstrated how actors saw this as becoming more important during the 1980s. During data analysis, I came to understand the phrase as being more than just a cliché growing out of cordial relations between the union and management. Instead, it pointed to a specific goal of the cooperation

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[67] A work paid for by Metal, written by a journalist. Not a scientific work of history with references, but a popular account of Metal's history in Lillevik based on archival sources and interviews.
[68] This particular quote is a paraphrasing of two quotes from two different interviews with trade unionists, brought together here for readability.

between the labor-market parties, namely that of attracting more investment to Lillevik from Metal Corporation – investments that could contribute to reducing the cost per ton of aluminum, or even better, that would raise the annual output. The way to obtain new investments was to convince Metal Corporation about a project and that it would pay off, which involved plans for cutting costs. The example above with Alphamelt illustrates well how this could go about. After convincing Metal Corporation, investments would be made and gains would have to be realized. The way gains were realized with the implementation of Alphamelt – by increasing operator responsibility – put Metal on a trajectory that led to the current organization of the labor process in autonomous teams.

Class Compromise as Integrated Industrial Governance

Industrial relations at Metal were characterized by cooperation based on a compromise where the trade union participated in efforts aimed at increased efficiency, and in return no one would lose their job. Fundamental to the compromise was the understanding of a common interest at Metal: securing continued operations at the smelter. This could even mean taking the initiative to reduce the workforce, as the union did in order to secure Alphamelt. The class compromise did not fall out of the sky, but rather developed over time alongside the increasing importance of operators' knowledge in improving the labor process and the implementation of new technology. The way executives and the trade union at Metal understood the class compromise is well described by Erik Olin Wright's notion of *positive class compromise* (2015). Cooperation in industrial relations was seen as beneficial for both sides, rather than as a zero-sum game. The cooperation can also be seen as integration: capital internalizes the interests of labor, while labor internalizes the interests of capital, with the result being a "system of industrial government that increasingly supersedes the traditional pluralist-adversarial system of industrial relations (Streeck 1992, 164 as quoted in Olin Wright 2015, 199)." This integration, however, relies on actors' understandings of Metal Industries and industrial relations, these can be fruitfully

understood by drawing on concepts originally coined in the realm of politics, namely the concepts of *hegemony* and *ideology*.

 While the concepts of hegemony and ideology were developed in the theory chapter, it is useful to re-state the main assumptions here. Hegemony is about consent to rule, and this consent is achieved by the hegemon's formulation of a common interest. This common interest allows the fusing together of heterogenous elements into a new whole (such as Streeck's industrial government). What fuses these elements and keep them together is ideology, understood here not as a merely a worldview, but as social processes which both make sense of and structure people's everyday experiences.

What is hegemonic at Metal is the compromise between the trade union representing operators (labor), and management representing capital. The two entities are fused together by the ideology of a common interest (we have the same goal, but might have different ideas on how to get there). At the core of this common interest lies the goal of securing the continued operations of Metal in Lillevik. To achieve this, the trade union might even agree to job reductions, as they did when choosing Alphamelt. Here, management cannot simply be reduced to "agents of capital" in the sense that their sole concern is the continued profit of Metal Corporation. Rather, their main concern is the profit of Metal *Industries,* in Lillevik. The profit in Lillevik is not an end in itself, but a means to achieving the main goal, the securing of jobs (including their own). Thus, there is a cooperation for profit in Lillevik, but one that is understood as a means to an end. In this way, the hegemon (the industrial government) here formulates the interests of the people of the smelter as a whole, and operationalizes them on a concrete level when working to win new projects. In the realization-of-gains part of the cycle, the contradictions between labor market parties are at their strongest, when manpower reductions following from robotization are discussed.

Ideas on the conduct of trade unionism or the wisdom of management are not enough to maintain the hegemony; it relies on a material basis and is bound up in material practices. Wages, working conditions and safety equipment is part of this ("in the

1970s they negotiated over trifles"). But at the core of the specific compromise at Metal is the marriage of job quality and effectivization. Operators feel that they are listened to (we have a flat structure), and because of the flat structure, Metal does well in terms of competitive advantage. Job quality, then, is not only good for operators – it is also good for efficiency because workers participate in and support continuous improvement, employee-driven innovation, and robotization efforts. This is done partly due to the agreement that no one is to lose their job, implying that as long as there is a pool of operators close to retirement age to fall back on when manpower is to be reduced, it is possible to maintain the compromise (a senior manager estimated that they were facing a generational shift, and were optimistic that "enough" retirees would be present in the foreseeable future). The presence of people who can voluntarily retire is thus a necessary condition for the continuation of the class compromise in its current form. In addition, the relative strength of the two parties to the compromise matters. The trade union sustains its associational power by making sure new operators are unionized. At the same time, management is able to maintain some kind of knowledge parity when it comes to details of tasks, thanks to the software monitoring how long each operation takes.

To be effective, ideology must be able to structure and make sense of people's everyday experience. An everyday experience that is continuously reproduced at Metal by the organizational form of the autonomous teams, was that of making decisions without deferring to managers and take initiatives to solve problems. As discussed in chapter five, operators perceive problems of production as their problems; thus, solving these problems becomes a naturalized part of *their* responsibility. Taking part in effectivization efforts is natural for the individual operator, and thus natural for the trade union as well. This is not to say that the experiences of individual operators *determine* trade-union policy, but rather that they mutually reinforce each other. [this notion will be developed in the coming chapter]

Cooperation for firm development at Metal thus goes deeper than agreements stating that no one is to lose their job due to robotization. Such agreements were the outcome of a "system of industrial government" which rested on the understanding that "we are all in the same boat".

Conflict and Cooperation at Safe and Metal

This chapter has shown how industrial relations at Safe and Metal were characterized by conflict and cooperation. At Safe, the trade union was unhappy about the increasing use of temporary labor, while executives saw discontent as being caused by workers not being sufficiently informed about the strategy of reorientation. The "new authority's" rescinding of informal agreements in order to execute reorientation created a situation in which appeals to a common good was not enough to secure commitment; they had to use monetary incentives instead. At Metal, the situation was the opposite, and a narrative of common interest and being in the same boat ensured commitment to robotization even if it involved a reduction in jobs. This commitment, however, relied on formal agreements that no one was to lose their job. At Safe, relations between trade union and executives can be characterized as a zero-sum game, what Olin Wright calls a negative class compromise (2015). At Metal, however, cooperation was seen as being beneficial to both sides, thus exemplifying Olin Wright's positive class compromise.

The difference between Safe and Metal also highlights the complexities of *cooperation for firm development*. At Metal, firm development – understood as robotization – was enabled by the hegemonic class compromise of being in the same boat. At Safe, on the other hand, firm development involving the use of temporary labor to achieve reorientation stood in the way of cooperation, as the use of temps was the primary grievance of the union against the "new authority". Thus, the content of firm development is not necessarily decided by cooperation; it also works in the opposite direction. The possibilities of cooperation are shaped by the type of firm development.

Another way to look at industrial relations at Safe and Metal is through the lens of Burawoy's concept of *hegemonic despotism* (1985), the coercion of workers to participate in efficiency efforts under the threat of capital mobility. At Metal, the threat of closure and of losing out to global competition was an integral part of the narrative of common interest. At Safe, however, the union did not see participation in effectivization as its responsibility, opting to fight for its members' immediate interests instead. The conditions for creating a common narrative between executives and workers also differed between the two firms. At Safe, the new executives had all been brought in from other firms after the private equity takeover of the firm, while at Metal, a number of executives had spent their entire careers at the smelter, having worked their way up from the shop floor. Their careers were thus more closely tied to the fate of Metal Industries than were the careers of the executives at Safe.

This discussion has drawn on previous chapters to show how industrial relations at Safe and Metal can be fruitfully understood as examples of negative and positive class compromises, and how these compromises were informed by firm characteristics developed in the previous chapters, such as the different strategies, the interpellation of workers in the labor process, and the use of temporary labor and robotization to mitigate labor costs. The accounts from Safe and Metal in chapters four to seven have thus served to produce four pieces of a puzzle. The task now remains to fit these pieces together in order to show how they are not isolated characteristics, but rather constitute the key aspects of the different factory regimes at the two firms. The next chapter will thus conclude this dissertation by uniting what has so far been analytically separated into a coherent whole – the differing factory regimes of Safe Manufacturing and Metal Industries.

Chapter 8: Bringing the Pieces Together – Conclusion

This chapter will bring together the pieces of the puzzle by drawing on previous chapters to show how two different factory regimes are reproduced at Safe Manufacturing and Metal Industries. After demonstrating how an adversarial regime is reproduced at Safe and a cooperational regime is reproduced at Metal, I will put my findings into dialogue with the NCM literature assembled in chapter two. My analysis has shown how NCM-type regimes are not universally adopted among Norwegian manufacturing firms, not even in the fully organized part of working life. Here, skeptics might argue that Safe, while not fully committed to cooperation, still enjoys central advantages from the Norwegian institutional context such as collective bargaining and regulation of conflicts. In order to nuance the discussion, I suggest two concepts for understanding advantages conferred upon firms from the institutional context: passive and active advantages. I will then go on to discuss the effect of temporary labor on work organization at Safe, arguing that while the reorganization of production to enable systematic numerical flexibility increased tension in industrial relations, this was not the only cause of adversarial industrial relations. Instead I will point to the challenges of production and financialized ownership as the main obstacles to the evolution of an NCM-type regime.

I will also discuss some limitations to my study, as well as what I see as interesting avenues for further research, before ending with a personal reflection on the merits of the Norwegian cooperative model. First, however, I shall turn to the central research questions, and piece together the findings of the previous chapters to explain why different factory regimes were reproduced at Safe and Metal.

Safe Manufacturing

Safe Manufacturing operated in a market in which flexibility was key. The hit-rate in bids for tenders, changing customer priorities, and a host of other contingencies all called for an organization that could change priorities quickly. As Mathias the foreman put it: "If Mons [production executive] tells me that we are going to bake bread

tomorrow, then I will be able to make it so (p. 124)" The unpredictability of production was increased by the new strategy of reorientation, which entailed entirely new products, new types of demands from customers, and an overall increase in the number of contingencies. Overseeing the labor process facing these challenges was a hierarchy of managers who coordinated and controlled the labor process by way of simple control.

The Reproduction of Managerial Authority in the Labor Process

The authority of the managers was established in the formal organization at Safe. In addition, it was reproduced in practice on the shop floor through managers' privileged access to information of what was going on in production. "[..]if there is something they need to know, we inform them (p.109)" as Mads the leading worker explained. There were no screens where everyone could keep track of the different products on their way through Fabrication and Final Assembly. Instead, the knowledge of what was to be done was meticulously pieced together by managers in meetings, and then used to coordinate shop-floor workers. This way of doing things can be understood as an *ideology of managerial control,* framing the labor process as chaotic and unpredictable, and therefore in need of coordination from the managerial bureaucracy, interpellating the worker to do as he was told and leaving control and coordination to the leading workers and foremen.

Subjecting to this order in turn qualified workers for performing the role of worker; it also qualified them for "qualifying" the ideology of managerial control in return, negotiating its range of application and form (Therborn 1999). In other words, the managers could only coordinate and control the labor process to the extent that workers went along with it and accepted the authority of the managers. Resistance, however, was made harder by the lack of information necessary to actually coordinate production on the part of workers, leading to attitudes such as the one expressed by Otto: "I have no idea where these are heading, I just try to do my part of the job (p.119)". Hence, in the labor process at Safe, a certain type of industrial subject was

interpellated: a subject subjecting to the authority of the managers, primarily taking responsibility for whatever tasks the leading worker or foreman had assigned to them. The authority of the managerial bureaucracy was thus reproduced by the way the knowledge necessary for coordination and control of production flowed. The locus of authority was located in the managerial bureaucracy because it was here the knowledge necessary to coordinate the labor process resided.

Even in the troubleshooting of new products – in the 'curing of children's diseases' where the workers had the critical knowledge for converting the blueprint into a physical product – the authority of the manager was underlined, as workers were to contact the managers, who would decide whether to bring the problem to the attention of the engineers at Technical or not. The interpellation of workers in the labor process at Safe was an ongoing social process, but a social process in which the authority of the managers was continuously reproduced.

The Reproduction of Adversarial Industrial Relations

Like Otto, the trade union at Safe was also concerned with doing its part of the job, and the primary job of the union was to fight for its members interests. This took precedence over efforts to make production more efficient: "[Olav] states that he doesn't think these questions are part of the responsibility of the trade union (p203)." Hence, at Safe, the union was not participating in "adjusting the governance of the employment relationship to the imperatives of joint competitive success (Streeck: 1998: 15)." Rather, it was concerned with winning concessions from Safe for its members to the extent that it would not use the employee representative on the board as a means to gain knowledge relevant for local wage negotiations. Instead "the CEO and the chairman go and discuss how much money can be negotiated over in the local wage negotiations (p. 208)," as Mads explained. The union then, rather than adjust their demands in accordance with the economic situation, chose a strategy of avoiding knowledge in order to be able to raise maximal wage demands. The most pressing issue for the trade union at Safe, however, was the question of temporary labor.

The unpredictable nature of production at Safe was understood to call for flexibility afforded by the managerial coordination of production. It also led to a fluctuating need for labor – a problem solved by hiring Eastern European migrant workers as temporary workers. While this had intensified under the new strategy, temporary labor of differing origins had been used at Safe since the 1980s. It thus represented *systematic numerical flexibility*, rather than an emergency measure for a hectic period. In addition, migrant workers were also seen as more industrious than their Norwegian counterparts. They were bearers of a work ethic which had "disappeared from Norway 15-20 years ago (p. 163)", according to Einar the engineer.

The use of temps was also the main cause of mistrust between the trade union and executives, especially after 17 workers had been made redundant before being replaced with temps shortly after. The union had used competence and experience as an argument for more regular employees and less temps, but met with little success. The temps were for the most part not organized in a union. In addition, frustration with the union's results in the struggle over temps led to members quitting, weakening the union further. The presence of migrant workers meant the workforce was divided into two different groups with little social interaction between them and with different terms of employment. Along with stagnating wages, the use of temps was the union's main grievance against executives and an important cause of the adversarial nature of industrial relations.

Safe's executives and the trade union had different views about the firm's development. The trade union attributed the use of temps, stagnating wages and redundancies to the new authority: "The new executives, they are quite hard on us (p. 192)," as Olav the trade unionist put it. Executives, on the other hand, explained the frustration on the shop floor with the workers not being up to date on the new strategy

of reorientation. Thus, there were at least[69] two widely different interpretations of the situation at Safe – unlike at Metal, where a common ideology fused the union and executives together in a system of integrated industrial governance. The strategy at Safe was formulated among the executives and the owners in the board, rather than in cooperation with the trade union. Executives saw their role as steering the ship through the dire straits of reorientation and doing what was necessary, and then informing the shop floor of what Safe's situation demanded, instead of figuring out in dialogue with the trade union what was necessary – a dialogue that the trade union did not necessarily see it as their role to take part in anyway.

Reproduction of an Adversarial Factory Regime

The factory regime at Safe was characterized by managerial authority over coordination and control of the labor process, temporary workers, and adversarial industrial relations. Erik Olin Wright's notion of a negative class compromise, where industrial relations are seen as a zero-sum game, aptly describes the relation between the new executives and the trade union. Hence, Safe Manufacturing differs significantly from the type of regime prescribed by the Norwegian cooperative model formulated in chapter two. While Safe seemed to adhere to the regulation of working life provided by the bundle of institutions referred to as the Norwegian model, cooperation for firm development – the hallmark of the Norwegian cooperative model – was not prevalent during my fieldwork. However, one could argue that I visited Safe in a special period, a period of crisis following the crash in oil prices, and that the NCM and cooperation between firm and trade union would be rejuvenated as soon as profits returned.

Based on my preceding discussion of Safe, however, I would argue that a return to an NCM-type production regime at Safe seems unlikely. Another question is whether

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[69] While I was not able to access the group of migrant workers enough to get an understanding of what the general view of the situation was among them, they might have an altogether different take on the situation.

there was an NCM-type factory regime at Safe in the first place. While the *new authority* (new owners and executives) and the financialization of ownership it entailed mattered, the strategy of reorientation did not alter the labor process at Safe significantly. Instead, it seems merely to have strengthened aspects that were already present, such as managerial control and temporary labor, aspects that were answers to challenges posed by the demands of production at Safe – production toward a specific market in which flexibility was important and competition for tenders made the future work load unpredictable. Managerial control and temps in turn made adversarial industrial relations more likely by way of the interpellation taking place in the labor process, and the interpretation of temporary labor as a grievance on the part of the trade union. Thus, what was understood to be the main challenge of production – flexibility to handle a market characterized by unpredictability – was answered in ways that made an NCM-type regime less likely to develop.

According to Erik Olin Wright: "[..] under certain social and technical conditions of production, working class associational strength within production may enhance the possibilities for more complex and stable forms of cooperation between labor and management (2015, 198)". Later, I will argue that this was the case at Metal Industries. At Safe, however, a strong union with which to develop a stable form of cooperation was not present, nor did such cooperation seem to be high on the list of priorities of executives or the union itself. For executives, systematic numerical flexibility provided tangible advantages, such as scaling the labor force according to demand, and "industrious" workers.

It does not follow from this that the factory regime at Safe was not susceptible to change. The argument being made, however, is that the current demands of production made bureaucratic control of the labor process and migrant labor relevant solutions. These, in turn, caused (in the sense of "pushed towards") reproduction of adversarial industrial relations and hence little cooperation for firm development. On this basis, I would argue that the most likely way the factory regime at Safe would

change was if the demands of production changed. One can make the counterfactual argument that more serialized production and increasing predictability might make procedures relevant, opening up the possibility for mobilization of worker knowledge by continuous improvement or EDI, similar to the situation at Metal. This in turn might change the mode of interpellation in the labor process, increasing worker commitment and responsibility for production alongside a diminishing of managerial control. Such predictability might in turn enable ubiquitous information throughout production, enabling workers to coordinate and control task allocation. In short, had the challenges of production moved in a direction resembling the stability and predictability at Metal, the conditions for an NCM-type regime might have developed, and cooperation for firm development might have offered more advantages.

Metal Industries

The production of aluminum alloys at Metal was dictated by the flow of liquid metal. Production in the Anode Bakery, Electrolysis and in the Casting Hall was a question of timetables and schedules. Deviations from these risked the metal solidifying, the destruction of equipment, and the loss of valuable production time. The yearly output of the smelter had been stable at maximum capacity for over a decade. Hence, production had a certain predictability to it. How much metal to make, as well as the physical demands of making metal, were constants. Production therefore both allowed for, and benefitted from, the standardization of tasks into procedures, a process driven by a need for both efficiency and safety.

The Reproduction of Concertive Control in the Labor Process

In the production halls at Metal, procedures delineated a space within which operators were delegated a degree of decision-making authority. On the autonomous teams, norms regulated the work effort and conduct of team members, making the question of conversion of labor power into a horizontal rather than a vertical matter. This concertive form of control, where the locus of authority lay with operators themselves, contributed to the naturalization of responsibility for production. Operators took on

responsibility for problem-solving on the shop floor and also saw the problems of production as their problems to solve. Hence, participation in EDI and time-studies became a naturalized part of work (along with responsibility for the researcher doing participant observation).

The knowledge necessary to coordinate tasks in production was displayed on screens, and thus accessible for all operators, to the extent that the effectiveness of attending meetings was questioned by Ove the operator: "Why do we even need to go to the morning meetings, when we can see all the necessary info on the screens anyway? (p. 138)" Hence, the situation at Metal was the opposite of the managerial control at Safe; the ability to allocate tasks lay with the operators. When it came to coordination of tasks, the authority of the operators was continuously reproduced because operators had the best overview of the details of production and were the ones best placed to answer the question of "what is to be done?". Contrasting the flow of information at Safe and Metal, one could say that at Safe knowledge was made to flow to where formal decision-making authority was located (managers), while at Metal, decision-making authority was moved to where the knowledge of production resided (operators).

The labor process at Metal interpellated operators in a different way than workers at Safe. Rather than being subjected to the authority of the team leader, operators were subjected to the norms regulating behavior on the team. This in turn qualified them to qualify those norms in return, for example by sanctioning lazy workers, or telling stories during overlap of who one worker had not prepared for the next shift, or challenging such norms, as Ove did: "Is that my problem?" (see p. 131). Sanctions and stories thus functioned to affirm the ideology at Metal that stated that it was a place with a flat structure where production was governed by operators. Furthermore, this was not only good in itself, it was also behind Metal being "one of the best smelters in the world" (p. 219). The outcome of the labor process at Metal, then, was not only aluminum, but also operators who saw themselves as responsible for production and for coming up

with suggestions to improve it. This participation in efficiency efforts was echoed in the area of industrial relations.

The Reproduction of Cooperational Industrial Relations

The trade union at Metal understood it as part of their role to participate in the maintaining of competitive advantage. As Truls the shop steward put it: "We shop stewards know this game, we are not here to raise hell for Metal. We are to serve our members, but also to help the company (p. 216)." This concisely sums up how the union at Metal saw their role – serving their members and the company – as two sides of the same coin: a positive class compromise in which cooperation was understood as win-win rather than a zero-sum game, in the terminology of Olin Wright (2015).

This state of affairs was contrasted with the past by old-timers, who referred to a shift in the nature of industrial relations starting in the late 1970s, during the same period as Alphamelt technology was introduced. One way to understand the implementation of the new technology is that it created a know-how vacuum, since no one knew how to best organize tasks in this new working environment. Executives decided to mobilize operator knowledge to fill this vacuum, marking the start of a turn to the experience-based knowledge of operators to improve the efficiency of production. At the same time, some of the ideas of the industrial democracy experiments were being institutionalized in the *Agreement on Development*, the new law on the working environment (AML). Twenty years later, a large proportion of decision-making was delegated to the autonomous teams in Lillevik by the organizational reform that removed several layers of managers, including the foremen from the teams.

The relations between trade union and executives enabled cooperation for firm development. One of the forms this took at Metal was robotization after the firm had convinced Metal Corporation to invest in making the smelter a pilot smelter for robotization of the entire corporation. Robotization was agreed to by the trade union in the name of efficiency, which was in turn accepted in the name of securing continued operations in Lillevik. In addition, no one was to lose their job against their

will due to robotization, a demand that was possible to accommodate for the foreseeable future as Metal had a large group of operators who were approaching retirement age.

Reproduction of a Cooperational Regime

The factory regime at Metal was characterized by operators' responsibility for coordinating the labor process, and cooperation between trade union and executives for firm development. Hence, if Safe was characterized by an adversarial regime, Metal was characterized by a cooperational one, much like the literature on the NCM prescribes, allowing for, "adjusting the governance of the employment relationship to the imperatives of joint competitive success (Streeck: 1998, 15)." Operators' responsibility for production, the importance of robotization for Metal's viability in Lillevik, the importance of Metal for Lillevik itself, the link between competitive advantage and operator knowledge; all these were elements of the grander narrative of Metal Industries, which I earlier called "Metal's story of itself" (p. 217). Understanding this narrative as an ideology, I see it as holding together the hegemonic class compromise at Metal by formulating a common interest – a common interest in which the primary goal was the continued existence of Metal in Lillevik.

The cooperational regime as I have understood it here relies on the continued interpellation of operators in the labor process who saw participation in efforts for "joint competitive success" as part of their responsibility. As long as such operators form the terrain on which the trade union formulate policies, it seems likely that the "cooperation line" in union outlook will continue. An important element for the reproduction of operator authority in the labor process was the ubiquity of information necessary for coordination on screens and computers throughout the production halls, a condition for the reproduction of the locus of authority.

Earlier, I introduced Erik Olin Wright's argument that under certain conditions of production, cooperation in industrial relations might be beneficial to capital (2015). I will argue that this notion describes the state of affairs at Metal quite well: executives

at Metal saw cooperation as an asset because it made implementation of projects such as robotization easier, and it gave credibility to executives' attempts to convince Metal Corporation that such projects were viable, and hence obtain further investment in Lillevik.

An important "social and technical condition" here are the procedures regulating production because they allowed the mobilization of operator knowledge in a systematic way – not only in making routine tasks more efficient, but by making the mobilization of operator knowledge for technology implementation, from Alphamelt to AGVs, easier. The integrated industrial governance (hegemony) at Metal also made it possible to acquire projects from Metal Corporation such as pilot robotization, not because the "realizing gains" part of the cycle of investment (see p. 101) would not be contested, but because there were forms of cooperation in place that could withstand these disagreements. Hence, it is easier for executives at Metal to promise productivity gains through manpower reduction to decision-makers at Metal Corporation. Therefore, the positive class compromise at Metal is reproduced not only due to interpellation in the labor process or formulation of a common interest; positive class compromise also solves problems for capital, or rather, for executives at Metal whose careers (to some extent) were tied to the continued existence of Metal Industries in Lillevik. Thus, there is potential for articulating a common interest between local executives and operators in that the careers of both are tied to Metal in Lillevik. However, even though a strong trade union might be seen as beneficial from the executives' point of view, this does not mean that conditions of production automatically create a positive class compromise.

In Joan Woodward's classic *Industrial Organization*, she argues that when process industry is concerned, "the plant itself provides a framework of discipline, control and coordination[70] (1965, 153)." Read in a deterministic way, it would seem the smelter

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[70] The full quote starts with "Inside the inner ring", which Woodward use to designate all the tasks necessary to keep the process going.

itself creates the organization of production it needs. This is not the case at Metal. Still, the production itself places some absolute demands on the production process. How these challenges are best solved, however, is a question of how actors interpret them. The evolution of the organization of production at Metal illustrates this, with hierarchical production being perceived as the "best" solution from the start, before ideas arguing for the usefulness of operator knowledge and participation took root in the late 1970s, culminating in the organizational reform of "autonomous teams" in the early 2000s. Thus, the ideas of what solutions were "best" were influenced by the wider society. This should be kept in mind, even though this dissertation is concerned with understanding developments within the smelter. Still, Safe and Metal have had different trajectories while being part of the same "wider society", or rather, institutional framework. Safe stuck with managerial control of the labor process, while Metal changed the labor process into one relying on concertive control and delegation of responsibility. I therefore argue that the differences between Metal and Safe should be understood in light of the different demands of production (as interpreted by actors).

Another important difference between Safe and Metal was their position in their respective locales. Metal was a cornerstone firm in Lillevik. The fortunes of Metal were understood to be closely tied to the town, and as Ole-Martin the operator put it, "[..]for Lillevik it would be a tragedy if Metal was to close down (p. 175)." There was also an internal job market at Metal: it was possible for operators to rise through the formal organization and become high-level managers. This could happen by first making the move over to the managerial side and becoming a team leader, before rising further in the managerial hierarchy. In addition, it was not uncommon for Metal to recruit managers among the shop stewards, and I encountered several high-level managers with a background as trade union activists. In fact, it was so common that Truls the trade unionist felt that operators questioned his motives for becoming a shop steward: "they immediately accuse you of doing it because you want to become a manager (p. 216)." Personal motives aside, one consequence of this was increased potential for

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common identification and a common understanding between managers and the trade union. Safe Manufacturing, on the other hand, was located in Storesand, where the company was either too small or the town too large for Safe to play the role as cornerstone firm. Rather, for people with skills related to manufacturing, Safe was one of several possible places to work.

The factory regime at Metal, contrary to Safe Manufacturing, very much resembles the prescriptions of the NCM, and the ideal type used in this dissertation. This is, I argue, because the advanced cooperation it enables responds to the challenges posed by production at Metal. The responsibility for production following from concertive control creates support for incremental process innovation by way of EDI or continuous improvement, and makes the implementation of robots easier. The formulation of a common interest together with the interpellation of the labor process produces industrial subjects supportive of EDI, and constitutes a terrain in industrial relations conducive to cooperation. Does this mean that the factory regime in its current form at Metal has reached Fukuyama's *end of history* (1992), in the sense that future problems are best solved by the regime already in place?

While the regime at Metal seems stable for the time being, there are ways to imagine its reproduction being disturbed. A change at the top executive level might bring in new executives more skeptical to the local class compromise. It is possible to imagine executives with corporate careers spanning many firms being less concerned with the future of jobs in Lillevik, identifying more with the goals of Metal Corporation. Alternatively, the robotization drive could exhaust the reserve of operators approaching retirement, meaning that the promise that "no one is to lose their job" might be put at risk. Bad times in the aluminum business might also cause increased tension between executives and the trade union, leading to a fracturing of the class compromise. Still, it remains my view that the positive class compromise at Metal seems quite deep-rooted. It has developed over several decades, offers advantages to capital in terms of advanced organization of production, and workers feel that "they

are listened to", as Ole-Petter put it. Hence, the current regime at Metal seems to offer advantages to both the labor and capital side, in line with Olin Wright's concept of positive class compromise. Having constructed two factory regimes from the narratives from Safe and Metal, it is now time to put these abstractions into a more direct dialogue with the theory of the NCM.

Consequences for our Understanding of Norwegian Working Life

I have shown how different factory regimes were reproduced at Safe and Metal because actors had different understandings of the challenges of production. At Safe, the strategy of reorientation increased the need for flexibility both in the labor process and in their need for labor, and this was solved by managerial (simple) control of the labor process and systematic numerical flexibility. The labor process interpellated workers to be given instructions rather than to take responsibility for production. The use of temporary workers was a major cause of conflict between the union and the "new authority". At Metal, the situation was the opposite, and the strategy of cost-cutting was based on the predictability of production. The standardization of tasks in procedures enabled the delineation of a space within which operators were delegated responsibility, interpellating operators who saw control and coordination of production as their responsibility, and creating both operators willing to participate in effectivization measures, and an object on which operators' knowledge could be brought to bear (the improvement of procedures). This participation in efficiency in everyday work was echoed by the trade union's policy of participating in efficiency, having a common interest with executives and managers in securing jobs in Lillevik. Hence, the factory regime at Metal can be said to adhere to the prescriptions of the NCM, while Safe did not. What do these findings entail for our understanding of Norwegian working life as seen from the *cooperative research tradition* (Falkum 1998)?

The Prevalence of a Norwegian Cooperative Model

The first point to make is that the type of production regime prescribed by the NCM, one characterized by autonomy in the labor process and cooperation for firm

development, is not universal among Norwegian firms. This is hardly surprising, and corresponds to research by Hvid and Falkum, who find that "governance and managerial forms vary considerably between industries. This variation challenges the idea of 'one best way' that 'fits all'. We need to question the idea of a common working life model in Norway[..] (2019)." In Hvid and Falkum's investigation, they join manufacturing and technology together as one category of industry. My investigation has stayed within the manufacturing sector, choosing Safe and Metal as cases of firms successful against international competition operating from within the Norwegian institutional framework. Hence, even within this group of firms, the NCM is not unanimously adopted. Both Safe and Metal pertain to the part of Norwegian manufacturing that is organized (in LO and NHO). They are successful against international competition, while firmly embedded in institutions regulating Norwegian working life. Hence, they are places where one would expect to find factory regimes adhering to the prescriptions of the NCM. But, as we have seen, this is not the case for Safe Manufacturing. This lends support to Hvid and Falkum's argument that we need to question the idea of a common working life model in Norway.

Active and Passive Advantages from the NCM

Here it is of course possible to argue that it is my conceptualization of the NCM that is too strict, and that Safe draws many advantages from the institutional framework of the *Norwegian model*: regulation of conflict via collective agreements, a culture of speaking out on the shop floor, which in turn enables the "concurrent production" that executives saw as important. The Norwegian model does provide a lot of regulation that would seem advantageous for Safe – also regulations that are not necessarily understood as belonging to the Norwegian model, such as the NORSOK standardization discussed in chapter four. Still, in my data, I did not find an emphasis on employee-driven innovation, or much evidence that the mobilization of worker knowledge was seen as critical. I did find a managerial bureaucracy taking full responsibility for coordinating and controlling production, something understood to give Safe the necessary flexibility to quickly adjust to changing circumstances. I will argue that a

fruitful way of understanding Safe's relationship with the Norwegian model is to see the firm as enjoying the passive, or regulatory, advantages stemming from it, rather than the ones that have to be actively constructed on the firm level.

At Metal, on the other hand, responsibility for operators in the labor process went hand in hand with mobilization of operator knowledge and cooperation for firm development. These aspects of the factory regime were not directly imposed from collective agreements, but had been crafted locally over decades. Hence, if Safe was content to reap only the passive advantages of being located in the Norwegian institutional framework, Metal went further, not only benefitting from the regulations providing a minimum standard, but actively constructing a factory regime along the lines prescribed by the NCM. The concepts of active and passive advantages therefore serve to nuance understandings of factory regimes in Norwegian working life. Or, to put it another way, they might prove useful in describing the relation between institutions regulating Norwegian working life and what goes on at the level of the firm. For some firms, an NCM type regime might provide highly relevant answers to the challenges of production, while for others temporary labor and simple control over the labor process might be seen as more relevant.

Did Temporary Labor Destroy a Cooperational Regime at Safe?

A consequence of increased labor migration to Norway from Eastern Europe was firms reorganizing work in order to accommodate temporary labor (Eldring, in Bungum, Forseth and Kvande (eds) 2015). At Safe, Fabrication was almost exclusively manned by migrant labor. One could therefore argue that Safe is but a prime example of the threat temporary labor poses to the NCM, implying that there was an NCM-type regime at Safe before the arrival of migrant labor. The increased use of temps was understood to weaken the negotiating position of the union by the shop stewards. Olav the shop steward was unsure of whether they could stop production by striking or go-slow actions: "[..]in Fabrication and Final Assembly, production could go on with unorganized workers. For a while at least (see p. 200)." In addition to the strength of

the union, understood here as its ability to disturb production, the increasing use of temps at Safe was a major source of conflict between the trade union and executives. It could therefore be argued that labor migration did in fact lead to changes in the organization of work at Safe.

On the other hand, flexibility was not a new phenomenon at Safe, where the use of temporary labor had roots going back to the 1980s. The current form of temporary labor – migrants from Eastern Europe – could be said to represent something new at Safe. The use of temps had also increased with the strategy of reorientation implemented in the context of the oil-price crash. Based on the data presented here, however, it does not seem that the increase in temporary labor changed the organization of the labor process in a major way. The organization of work by bureaucratic control was grounded in interpretations of production as demanding the flexibility provided by the managerial bureaucracy, such as the ability to change priorities quickly or re-allocate tasks in line with rapidly changing customer demands. It was not grounded in narratives about migrant workers needing closer supervision. The two groups of workers were both managed by way of simple control. Thus, while systematic numerical flexibility posed problems for cooperation in industrial relations, the interpellation in the labor process also pointed away from the prescriptions of the NCM towards a system of adversarial industrial relations.

In addition, the takeover of Safe by Equipriv meant that the imperative of accumulation by success in industrial production was subsumed to an imperative of rapid growth in Safe's value on the financial market. This entailed the rescinding of informal contracts and trust (see chapter six), undermining cooperation between trade union and firm. Hence, in Safe's case, the form of ownership can be said to be as detrimental to cooperation as the use of temporary labor. The challenges of production, interpellation in the labor process financialized ownership and systematic numerical flexibility combined to impede cooperation for firm development at Safe. The story of Safe, therefore, should not be reduced to a simple narrative of temporary labor undermining

an NCM-type production regime. In fact, it is possible to argue that the use of migrant workers actually helped Safe through the oil-price crash by providing a means to achieve *systematic numerical flexibility*, upon which the firm depended to survive. This, however, is a question *raised* rather than *answered* by my findings. But if this were the case, it provides a dilemma for those who want to see stable employment as the norm in Norwegian working life: should firms' use of temporary labor as a response to weak economic times be seen as a necessary evil? Or should such firms rather go bankrupt, with the erosion of local skill that follows as a necessary price to pay for a well-organized working life? While this dilemma is beyond the scope of this dissertation, it is a dilemma faced regularly by Norwegian trade unions.

The Relevance of the NCM

Based on the analysis of my data, I have argued that the advantages offered by the NCM are seen as more relevant at Metal Industries than they are for Safe Manufacturing. Or, using the concepts introduced earlier, the *active advantages* provided by the Norwegian work life institutions are more relevant for the process production at Metal than they are for the small unit and batch production at Safe.

At Metal, reorganization is important to their strategy of cost-cutting, and workers' willingness to participate in it greatly helps robotization. Production at Safe has been "technologically stable" for a decade. There have been technological changes in production, but not on a level demanding major reorganization of work. Metal reaps benefits of commitment (from concertive control) when operators participate in EDI or continuous improvement, the latter being especially effective since detailed procedures provide descriptions of the work and can be continuously improved. At Safe, on the other hand, informal agreements have been rescinded, and there is now a reliance on monetary incentives, in addition to the industriousness of migrant workers, to mobilize the necessary effort. This is not to say that the active advantages of NCM have no relevance at Safe. Rather, it seems decision-makers at Safe see more advantages in temporary labor and market-oriented ways to mobilize effort. Here,

some might argue that this is but one example of decision-makers at Safe "not understanding" how good the NCM is. I would, however, reject this argument, based on my description of the way Safe is organized being embedded in how production is understood. The ideas informing the organization of production at Safe are not merely imported from the outside, but embedded in understandings of the problems posed by production. Hence, the active advantages offered by the NCM are more relevant for Metal than they are for Safe. Part of the explanation for this is that there are other advantages to be gained for Safe that undermine the possibility to realize the NCM, identified here as flexibility in the labor process stemming from managerial control and temporary labor.

What Does This Entail for the Future of the NCM?

Based on my findings from Safe and Metal, it can be argued that NCM-type factory regimes might be a better fit for process industry than for workshop industry. If this proposition is correct – in the sense that there are systematic differences in factory regimes between workshop and process industry firms – it could help understand broader processes in Norwegian working life. Sissel Trygstad has used fracturing as a metaphor to describe changes in Norwegian working life, where cooperation between labor-market parties decreases in certain sectors (Trygstad 2019 [71]). The model therefore seems to be rupturing, its prevalence decreasing. If this is the case, my findings from Metal and Safe could help understand where these fractures might appear and develop. The weakening of the NCM is not just taking place in the unorganized part of Norwegian working life, it is taking place at the "core" of the model – organized manufacturing industry. The evidence for this claim is the use of temps at Safe, understood as relevant answers to problems of production. It seems likely that the unpredictability of labor needs at Safe would also be a factor at other firms. If so, there would be a number of firms where temporary (migrant) labor would seem a relevant solution, risking increased tension in industrial relations and a lack of

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[71] Lecture given at seminar in honor of Ståle Seierstad, available online. URL in Literature

cooperation. That being said, it is also possible to argue that the NCM was never very relevant for Safe, having a history of relying on temporary labor and being content with adversarial industrial relations. In this view the problem is not only fracturing, but the non-existence of the model in firms from the very beginning. Hence, the object that is fracturing (the NCM) is smaller, and exists in fewer firms than might have been assumed. Again, here the notions of active and passive advantages might help to nuance the discussion.

The factory regime at Metal Industries follows the ideas prescribed by the NCM. In my narrative from the smelter, there were few signs of fracturing. Instead, the different characteristics of the regime seemed to mutually support each other. A more relevant question is, therefore, what does the continued success of Metal imply for Norwegian working life? While no one would lose their job against their will, it seemed likely that robotization would lead to reductions in total manpower at the smelter, perhaps accompanied by an increase in the number of operators or engineers with computer and programming skills. Hence, upskilling and fewer jobs might be an outcome of the strategy of cost-cutting. Unless, that is, Metal also succeeds in attracting further investment from Metal Corporation so that the workforce could remain stable while output increases.

The narratives from Safe and Metal, then, could be seen as illustrations of two possible trajectories for the organization of manufacturing in Norway – a trajectory emphasizing continued operator responsibility for production at Metal, perhaps even including a deepening of such responsibility, along with increased demands on operators' skill sets, while Safe could be seen to be on a trajectory where systematic numerical flexibility becomes a permanent characteristic of manufacturing. If the skills needed by firms of Safe's type are to be found abroad, it will have consequences for vocational education and work culture. It might also entail a fragmentation of worker collectivities and undermine the associational strength of trade unions.

Limitations of the Study

This study has highlighted certain aspects of Norwegian working life, namely what Burawoy calls the "subjective" side of work, and the relation between the labor process and industrial relations. In doing so, I have excluded other aspects, in particular those believed to pertain to the sphere of "economics". The price of electricity, oil price, interest rates, or other "macro" factors have only been discussed to the extent that they have showed up in my data. The same holds for the formal side of Norwegian working life: collective agreements and labor laws have been relegated to the background in favor of seeking to grasp actors' understandings of reality. When writing *Labor and Monopoly Capital*, Harry Braverman (1974) anticipated the critique against him for leaving "the subjective side" of work out of the equation. One could say that this study has emphasized the "subjective side", while putting less emphasis on the "objective" side.

Related to this is the focus on what goes on *in* the firms, while relegating the external relations of the firm to the background. I have discussed the *ideology* in the labor process based on my observations from the shop floor and the wider context of the firm. But the shop floor is not an isolated arena where ideology grows organically from the technology or organization of production. When managers at Metal stress the importance of operator knowledge and autonomy for their success, it is not a description emerging only from the experiences at Metal – it is a description that borrows from the knowledge regime of which literature on the Norwegian model and the Norwegian cooperative model is a part. Ideology is not produced exclusively on the shop floor, but also in trade unions, universities, consulting firms, management literature, and employer associations. The processes by which ideas float from such entities to the shop floor have not been the focus of this dissertation, but that is not to say that they do not exist or are not important. Rather, I have focused on one type of locale where such ideologies matter, namely the point of production and the organization of work.

The subjectivities of the migrant workers at Safe, however, are for the most part left in the dark. During fieldwork, I was not able to negotiate any kind of meaningful access to this group of workers. Such access would probably have yielded interesting data for my investigation, by potentially shedding light on questions such as: How do migrant workers view their employer, wage levels, their Norwegian colleagues, trade unions? Authority amongst the migrant workers and its reproduction would have allowed for a richer theorizing of the factory regime at Safe. Had I expected to encounter migrant workers, negotiating access might have met with more success, but this is hard to say. It might also be that Safe would not have been as welcoming if migrant work was a larger part of the project.

Overall, the narratives from Safe and Metal could have been made to speak to several different theoretical debates. Autonomy vs. hierarchy in the organization of the labor process; technology implementation; the relation between knowledge and authority, or debates on the changing nature of industrial relations. When I have touched upon such issues without making them the focal point of the dissertation, it is because I have sought to understand the different aspects of production as they relate to each other *in* the firm, making the narratives take center stage and using theory in an eclectic way, rather than letting theory take center stage and using data in an eclectic way. While this choice has been a conscious one, it does forego opportunities for engaging in depth with one particular theory. In one sense, these final paragraphs feel more like a springboard for further questions than a definite answer. I will therefore go on to formulate a few questions for further research opened up by the questions and answers discussed here.

Further Research

The proposition developed in this chapter has been the difference between the factory regimes of Safe and Metal, and the suggestion that this difference should be understood in light of the differences in the labor process. NCM-type production regimes seem to be more relevant for *process industry*-type production than for the

unit and small-batch production at Safe. It would be interesting to test this quantitatively, investigating the prevalence of the NCM-type regime among process industry firms and checking whether adversarial regimes are more common among manufacturing firms similar to Safe. Another way of testing this proposition would be to compare process industry across institutional contexts, in order to learn more about the role of institutions and technology in shaping factory regimes. Yet another interesting avenue for research would be the migrant side of the labor process, at Safe or another firm where the organization of work has been shaped to accommodate systematic numerical flexibility. Understanding how the labor process is experienced from the migrant side would enrich the narratives of work constructed in this study.

A Personal Reflection on the Norwegian Cooperative Model

So far, I have striven to keep an analytic distance to the question of whether the NCM is preferable or not. The crux of the matter for me would be the question of concertive control or autonomous teams. Is this a way to further enslave workers, as much Foucault-inspired literature would have it? Does the removal of the foreman merely tighten the iron cage of control, as James Barker[72] (1993) argues? Or is the NCM and its autonomous teams a superior way of organizing working life because workers are empowered in some way? Answering this question could potentially open up a vast philosophical debate which is outside the scope of this dissertation. I will limit myself to one rather straightforward point. Whether the NCM-type of concertive control/autonomy is preferable from the perspective of workers depends on what the alternative is. If the alternative is the managerial control at Safe, I would argue for the preferability of the autonomous team because it seems to offer a more meaningful job, where workers get to use and develop more of their capabilities, much in line with the thinking of socio-technical-systems theory. Here, one might make the counterargument that this is nothing but the cooptation of the working class, tricking

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[72] This dissertation has used Barker's notion of concertive control in order to understand the labor process at Metal. I maintain that a concept can be useful in analysis even though one does not agree to all its normative implications.

them into accepting downsizing and time studies, and offering more of their capacities up for the sake of the profit of a multinational corporation. I do not think there is one correct way to see this: one man's autonomous team might be the other's iron cage. Precisely because of this, I would argue for right of the workers in question to decide in this matter. The question then becomes one of the agency of workers; paraphrasing Gayatri Spivak (1994), the question becomes: Can the worker consent?

Bourdieu[73] answers in the negative – the worker is too bound up in her or his habitus: "The schemes of the habitus, the primary forms of classification, owe their specific efficacy to the fact that they function below the level of the consciousness and language, beyond the reach of introspective scrutiny or control by the will (1984, 466)." The domination of workers operates below the level of consciousness, and hence beyond the grasp of any active consent. The "schemes of the habitus" makes workers *misrecognize* the nature of their domination, a misrecognition seemingly impossible to break out of (Von Holdt and Burawoy 2012: 61).

For Gramsci, the opposite is the case. Rather than being ruled by the *schemes of the habitus* on a subconscious level, people/workers can transform their thinking through their practical activity. Advanced capitalism "not only justifies and maintains its domination but manages to win the active consent of those over whom it rules (Gramsci, 1971: 245[74])," the key term here being to win the *active consent*. This is in line with Göran Therborn's conception of ideology used in this dissertation, where ideology makes people recognize what exists (who we are and what the world is), what is good (right, just, beautiful), and most importantly for the point made here, what is possible and impossible (Therborn 1999, 18).

Answering the question of whether the NCM's autonomous teams is an example of a good working life, or an example of increased domination, is thus connected to another

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[73] The argument is inspired by the reading of Bourdieu and comparison with Gramsci found in *Conversations with Bourdieu* (Von Holdt and Burawoy 2012).
[74] As quoted in Von Holdt and Burawoy 2012.

question: Is there another knowledge regime with a political program that can realistically offer more than that of the research on the NCM, its prescriptions, and their political conclusions? Personally, I would say no, and therefore come down on the side that states that the NCM at present is the best available knowledge regime. A related point here concerns the working conditions of the academic, who, in her or his devotion to the job, often demonstrates a level of commitment even beyond that of members of the autonomous team. Hence, if the team member really is committing to increased domination within an iron cage, what then does this say of the researcher working late nights to reach a deadline?

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