How increased knowledge affects operators' opinions - a case study.

Ingibjörg Gróa Magnúsdóttir

Thesis of 12 ECTS credits
Master of Project Management (MPM)

May 2014

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A study of the implementation of Self-Directed Work Teams in an Icelandic aluminium manufacturing plant.

Ingibjörg Gróa Magnúsdóttir[1]

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Abstract

In a world of increased competition and fast development, companies deal with numerous problems. One approach to meeting these problems can be the use of Self-Directed Work Teams. Self-Directed Work Teams are considered one of the most popular forms of redesign in organizations today. According to Kimball Fisher (2000) Self-Directed Work Teams is a group of employees that have day-to-day responsibility to manage their work and themselves and work under a minimum direct supervision.

This case study takes a look at the use of change management in the implementation process of Self-Directed Work Teams in an Icelandic aluminum manufacturing plant. The implementation process is looked at through John. P. Kotters *The Eight-Stage Process* for achieving organizational transformation. The research questions of this case study are: 1) How can increased knowledge affect the opinions of the operators? 2) How did the increased knowledge influence the implementation process?

During this case study two questionnaire surveys were done focusing on the knowledge and opinions of the plants production line operators regarding Self-Directed Work Teams. The results of the surveys showed increase in negative answers and decrease in positive answers. In the time that passed between the two surveys the operators both received increased knowledge and began getting experience by working in Self-Directed Work Teams. Majority of the operators stay positive but the increase in negative answers might suggest that some employees are starting to object and show resistance to the SDWT system. According to change management a resistance is a completely normal part of the implementation process.

Keywords: Change management, Self-Directed Work Teams, implementation process, John P. Kotter

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1. Introduction

In a world of increased competition and fast development companies deal with numerous problems, such as employee dissatisfaction, decrease in production quality and quantity, counterproductive employee behavior and increased employee absenteeism (Tjepkema, 2003). One approach to meeting these problems can be the use of Self-Directed Work Teams (SDWT) [2]. SDWT are considered one of the most popular forms of redesign in organizations. According to Ceasar Douglas and William Gardner (2004): "SDWT´s are now used by nearly three out of four top 1000 U.S. firms" (p.48).

This case study studies the implementation process of Self-Directed Work Teams in an Icelandic aluminum manufacturing plant. The plant is located in a small town in the East Fjords of Iceland and was started in the year 2007. The number of employees is about 490 of which there are 257 production line operators. The plant has three production lines: the potrooms (A and B), the casthouse and the rodding and together they produce and process approximately 350,000 tons of aluminum per year, making the plant the largest producer of aluminium in Iceland. Preparation for the implementation process of SDWT began in July 2011 and finished in March 2014. The smallest production area, the rodding, was used as a pilot area. SDWT was first implemented there before any real changes were made in the other areas. When this study was conducted the three production lines were in different stages of the implementation process (A. Gunnarsdóttir, Personal Communication, January 12, 2014).

Two questionnaire surveys were done. First a survey, containing nine questions focusing on the knowledge and opinions of the operators regarding SDWT, was given to the operators of all of the three production lines. Three months later another survey containing three questions from the former study was given to the operators of the potrooms and casthouse to see if there had been any change in their knowledge and opinions. During the three months that passed between the surveys, the project manager of the implementation along with her team met with all the operators of the potrooms and casthouse and gave a

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[2] Self – Directed Work Teams are also known as self-managed work team, in this research I will use the phrase Self–Directed Work Teams (SDWT).

seminar about the ideology behind SDWT and how SDWT will, when fully implemented, affect the work of the production lines. The rodding was excluded from the second survey because the implementation process was finished and therefore the operators of the rodding received no additional information.

This study will take a look at the use of change management during the implementation process. The implementation process will be looked at through *The Eight-Stage* Process for achieving organizational transformation, which John P. Kotter wrote about in his book, *Leading Change.* The research questions of this case study are: 1) How can increased knowledge [3] affect the opinions of employees? 2) How did the increased knowledge influence the implementation process? This case study will also look at the difference in opinions and knowledge between a fully implemented production line and production lines that are in different stages of the implementation process.

2. Literature Review

This chapter will be divided into three subchapters. The first chapter will include an overview of change management along with a short overview of the plant's implementation process, the second chapter will detail the ideology of SDWT and how they work and the third chapter will detail John P. Kotters *Eight-Stage Process*.

2.1 Change management

The implementation process of the SDWT at the Aluminum Manufacturing Plant followed a traditional change management process:

> Change management is defined as the process of achieving the smooth implementation of change by planning and introducing it systematically, taking into account the likelihood of it being resisted (Armstrong ,2009, P.424)

There are three types of change; strategic, operational and transformational. The change that the aluminum plant is making in its implementation process is transformational:

> Transformational change takes place when there are fundamental and comprehensive changes in structures, processes and behaviors that have a dramatic effect on the ways in which the organization functions (Armstrong, 2009,P.425).

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[3] With knowledge I mean both knowledge of the ideology behind Self-Directed Work Teams and knowledge of how Self-Directed Work Teams will operate when fully implemented

In Figure 1 a change management process can be seen; first there is denial, then resistance, commitment and finally exploration. Each step is described in figure 1.
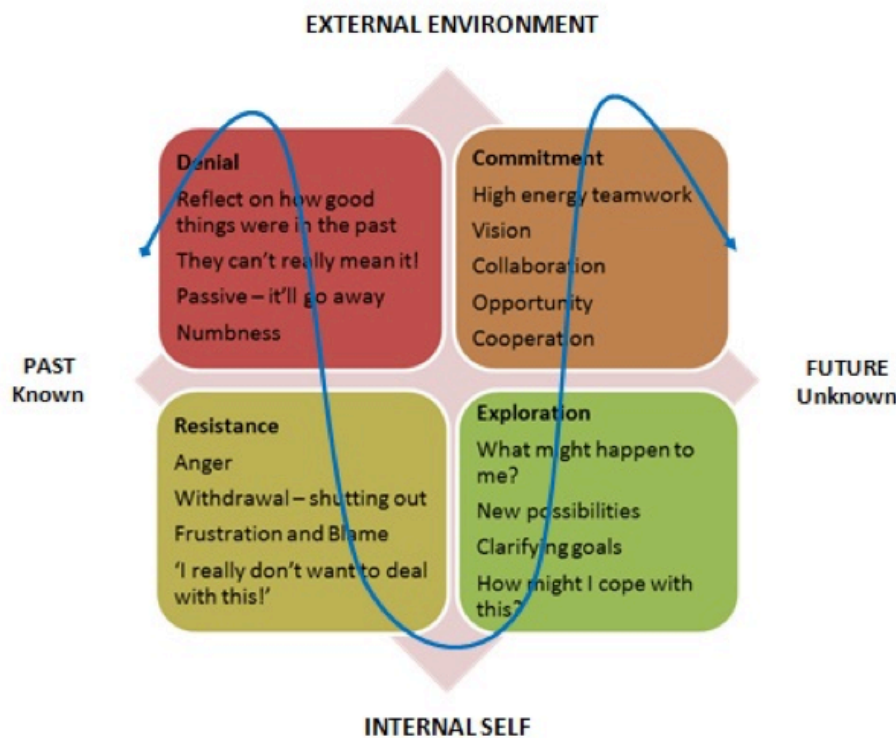

EXTERNAL ENVIRONMENT

Denial
Reflect on how good things were in the past
They can't really mean it!
Passive – it'll go away
Numbness

Commitment
High energy teamwork
Vision
Collaboration
Opportunity
Cooperation

PAST Known

FUTURE Unknown

Resistance
Anger
Withdrawal – shutting out
Frustration and Blame
'I really don't want to deal with this!'

Exploration
What might happen to me?
New possibilities
Clarifying goals
How might I cope with this?

INTERNAL SELF

Figure 1 – the implementation process (source: Babcock, 2014)

The preparation for the implementation process [4] of SDWT at the aluminum manufacturing plant began in July 2011 and the implementation was finished in March 2014. The implementation process was well organized and followed a tight schedule. The project was to have four phases managed by one plant-wide project group, supported by three design groups (one for each production line) and one management group (sponsorship). The goals and actions were managed with Projects A3´s (see Appendix 2). One of the fundamental elements in a successful implementation, according to change management, is to create a vision and more importantly establish the need for change. These two factors must be clear to everyone involved in the implementation process. A seminar was given to all of the production line operators where this vision and need was detailed and explained.

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[4] More detailed enlistings on the implementation process can be found in appendix one.

The results that the aluminum plant is hoping to get by implementing SDWT are increased production, better quality of products, reduce of expenses, more profit and increased employee satisfaction. For the production operators, the aluminum plant hopes that by implementing SDWT they will achieve: better defined roles and responsibilities, more job variety, less need for supervision, more involvement of operators, better training, better use of operator talents, better results and increased employee satisfaction (A. Gunnarsdóttir, Personal Communication, January 12, 2014). This was all explained in the seminar where operators were also encouraged to give their opinions on changed processes and the implementation process in whole. In change management it is important that everybody take part in the implementation process. While changing the processes, needed for the implementation of SDWT, the operators were asked to assist with the making of new standard operation procedures, role descriptions and work descriptions. This is done so that the implementation process can become the property of everyone involved:

According to change management it is not uncommon to experience resistance among employees during the implementation process: "Resistance to organizational change is most frequently seen as a behavioral phenomenon whereby employees demonstrate opposition to management" (Mumby, 2005). This is a natural thing and many scholars have introduced systems and theories to react to such resistance. The ideology behind SDWT fits quite well into the change management process and therefore the plant´s implementation process of SDWT will be looked at later on in this article through the theories of a well known scholar in change management, John P. Kotter.

2.2 Self-Directed Work Teams

SDWT has been called the breakthrough of the 1990´s even though the origins of the SDWT concept date from the late 1940´s and early 1950´s. SDWT abandons the bureaucratic ways of work where the operators are solely concerned with the operational tasks and usually have no management responsibility. Today, research shows that the work of teams is showing more and better results than that of individuals (Tjepkema, 2003). But what makes

a team? According to Cameron and Green (2009) a team is a "distinguishable set of two or more individuals who interact interdependently and adaptively to achieve specified, shared, and valued objectives" (p63). Then the next question is; what makes a team a Self-Directed Work Team (SDWT)? According to Kimball Fisher (2000) a self-directed work team is:

> … A group of employees who have day-to-day responsibility for managing themselves and the work they do with a minimum of direct supervision. Members of self-directed teams typically handle job assignments, plan and schedule work, make production- and/or service-related decisions, and take action on problems. (p.17)

In their paper Roper and Philips (2007) write that the purpose of SDWT is threefold: (1) improve quality of the work environment, (2) increase overall performance of the company, (3) provide an environment that focuses on the company´s performance as well as the organization´s performance. During the implementation process, managers can become confused about what they should and shouldn´t do and what to expect of their employees. Studies have shown that SDWT have a higher rate of productivity, lower rate of absenteeism and an increase in positive work attitude (Petty o.fl., 2008). The difference between SDWT and traditional organization with bureaucratic ways of work are shown in Figure 2.

Self-Directed Work Teams	Traditional Organizations
Customer-driven	Management-driven
Multiskilled work force	Workforce of isolated specialists
Few job descriptions	Many job descriptions
Information shared widely	Information limited
Few levels of management	Many levels of management
Whole-business focus	Function/department focus
Shared goals	Segregated goals
Seemingly chaotic	Seemingly organized
Purpose achievement emphasis	Problem-solving emphasis
High worker commitment	High management commitment
Continuous improvements	Incremental improvements
Self-controlled	Management- controlled
Values/principles-based	Policy/procedure-based

Figure 2 SDWTs Versus Traditional Organizations (Source: Fisher, 2000)

It is not easy to switch from an environment of hierarchical structure to an environment where teams assume responsibility for their own decisions. Many companies have made a false start or given up. Two barriers tend to arise when SDWT are introduced to employees: resistance and misunderstanding. Being a member of SDWT means taking responsibility for not only your actions but those of others as well. New attitudes and behaviors need to be worked on as well as new work processes. A common

misunderstanding when implementing SDWT is "now I don´t need a manager and can do whatever I want" but that is not the case. To overcome these barriers SDWT must be introduced to the team in a way that builds mutual understanding and allows all team members to develop leadership skills. The individuals of the team must stop thinking "I" and start thinking "we". This can be achieved by giving the team enough knowledge about SDWT and make sure that all of the team members understand and know what it means to be a member of SDWT (Moravec, 1999).

SDWT can include between two and 12 members. Teams can be up to 25 members but it is not recommended to have more than 12 members per team. Little is known about how much time is required to fully implement SDWT, some scholars expect that it may take up to 24 months or even longer (Douglas and Gardner, 2004). Members of SDWT are believed to have the most knowledge of work related systems and operations. One of the advantages of SDWT is that their members are able to share their work-related knowledge and feedback with each other and by doing that learn from each other (Yeatts and Hyten, 1998). The final result of the work relies on the outcome of the team's job. Everybody in the team must have an interest in the outcome of his or her work. If the team is to be effective it needs to have a vision and a purpose. The team also needs to work together towards a common goal and to be able to cope with disruptions and problems that might arise without the intervention of the management (Roper and Philips,2007).

Implementing SDWT is a difficult process and companies often fail. The use of SDWT has received some criticism. According to an article by Geoff Colvin (2012), teams don´t last, especially if the company implementing them has a high rate of employee turnover:

> … one of the most overlooked issues for companies struggling to get their own teams performing better: Teams don´t last. Even great ones - especially great ones - break up as members seek opportunity elsewhere (p.22)

Another critique that SDWT has received is that members of SDWT need more training than members of regular teams:

> The program calls for an intensive training of workers, not only on technical skills, but in administrative and interpersonal skills as well. This massive training, the backbone of the program, aims to convert regular workers into well-rounded employees. In principle, there is nothing wrong with training. But, the program requires so much schooling that the main direction of the business could deviate from its course (Allender, 1993)

Also by implementing SDWT there will be a shift in power. That can be a difficult to accept for many managers and furthermore, they often do not know how the responsibility between managers and team members is supposed to be when working with SDWT. (Douglas and Gardner, 2004).

2.3 Kotter´s Eight-Stage Process

In his book, *Leading Change* (2012), John P. Kotter writes about the *Eight-Stage Process* for achieving organizational transformation where a sense of urgency and the need for change is the foundation of successful implementation. Without the right knowledge given to the operators, they will not sense this urgency and need for the implementation and might therefore resist it. This must be done in the preparation stage of the implementation process and then maintained throughout all of the implementation process.

Below is the *Eight Stage Process* for achieving organizational transformation:

1. **Establish a sense of urgency** – examining market and competitive realities; identifying and discussing crises, potential crises, or major opportunities. (Preparation)

2. **Form a powerful guiding coalition** – assembling a group with enough influence and power to lead the change. (Preparation)

3. **Create a vision** – creating a vision to help direct the change effort and developing strategies for achieving that vision. (Preparation)

4. **Communicate the vision** – using every vehicle possible to communicate the new vision and strategies and teaching new behaviors by the example of the guiding coalition. (Implementing)

5. **Empower others to act on the vision** – getting rid of obstacles to change; changing systems of structures that seriously undermine the vision and encouraging risk taking and non-traditional ideas, activities and actions. (Implementing)

6. **Plan for and create short-term wins** – planning for visible performance improvement; creating those improvements and recognizing and rewarding employees involved in the improvements. (Implementing)

7. **Consolidate improvements and produce still more change** – using increased credibility to change systems, structures and policies that don´t fit the vision; hiring, promoting and developing employees who can implement the vision and reinvigorating the process with new projects, themes and change agents. (Manage)

8. **Institutionalize new approaches** – articulating the connections between the new behaviors and corporate success and developing the means to ensure leadership development and succession. (Manage)

By looking at the implementations A3´s (Appendix 2) it can be seen how the project manager and her team went through the planning stages of the *Eight Stage Process*. In the implementation stages, the project manager held a seminar and members of the design groups introduced all changes made in new standard operation procedures, role descriptions and work descriptions to the operators. When the first survey was done, the production lines of the aluminum plant were in different stages of Kotter's *Eight Stage Process.* The production lines were in the following stages:

- **The Rodding:** The smallest production line and therefore the one to begin the implementation process. At the time of the study they were fully self-directed but still in *stage seven; Consolidate improvements and produce still more change.* Even though fully implemented there is still work to be done so that they can be considered to be in the final stage. The project manager and her team have already begun the preparations for the transition to stage eight.
- **The Casthouse:** The second production line to begin the implementation process was in *stage five; Empower others to act on the vision.* The operators did not have full information about the ideology behind SDWT but had started learning by doing since couple of their workstations had been implemented into SDWT.
- **The Potrooms***:* The largest production line and therefore the last one to start the implementation process was in *stage four; Communicate the vision.* The operators had not yet received full information about SDWT and only one SDWT team had been implemented. The implementation process for the rest of the SDWT were well on its way.

At the time of the second survey, three months later, the casthouse and the potrooms had reached *stage seven; Consolidate improvements and produce still more change*.

3. Research Methodology

The focus of this research is to study the knowledge and opinions of production line operators in an Icelandic aluminum manufacturing plant towards SDWT and to see whether increased knowledge will change the operators' opinions towards SDWT. If a change occurs, will it be for the better or worse and how might the change affect the implementation process?

During this research, production line operators working on the aluminum manufacturing plant´s production lines answered two different questionnaire surveys that focused on their knowledge and opinions of SDWT. Questionnaire surveys were used rather than something else because that was considered the best way to score the highest answering ratio among the production line operators. To get as high a ratio as possible, it was decided to meet the operators in their own working environment and go to their meetings, held at the beginning of each shift. In total, 13 shift meetings were visited during the first survey and eight during the second.

Three months passed between the two surveys. During this time an SDWT seminar was given to the operators of the casthouse and the potrooms. The first questionnaire survey contained nine questions, mainly focusing on the operators' knowledge and opinions of SDWT.[5] The second questionnaire, only given to the operators of the potrooms and casthouse, since the rodding was excluded, contained the same background questions as well as three questions focusing on knowledge and opinions of SDWT:

1. *How enlightened or unenlightened do you consider you to be about SDWT?*
2. *What is your opinion of SDWT ?*
3. *What are your expectations towards SDWT ?*

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[5] The questionnaires can be found in Appendix 3. Approximately 15% of the production line operators are Polish and therefore it was decided to also offer a Polish version of both questionnaires.

4. Results

This chapter will be divided into three subchapters. The first chapter will take a look at the first questionnaire. The second will focus on the second questionnaire. In both chapters, the focus will be on the three questions mentioned in the previous chapter. The third and final chapter will take a look at the research results.

4.1 The First Questionnaire Survey

85% of the production line operators answered the first questionnaire[6]. Within the production lines, the answering ratio was as follows: the potrooms 87%, the casthouse 83%, the rodding 70%.

*Question 1 - How enlightened or unenlightened do you consider you to be about SDWT?*
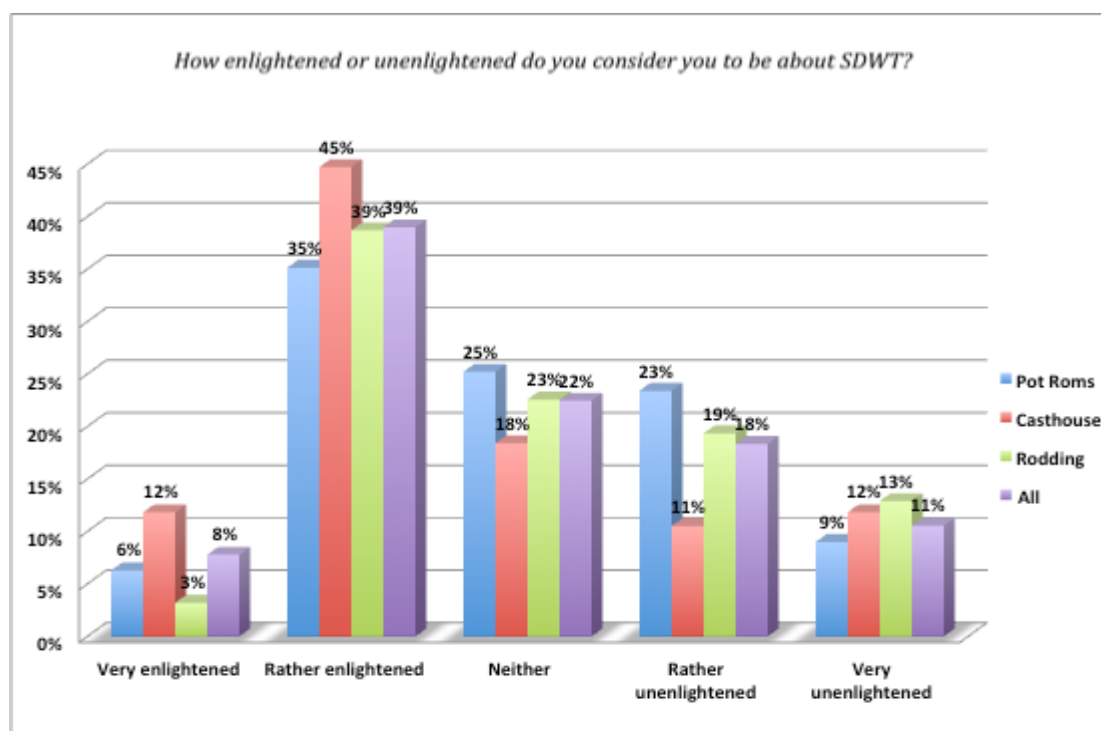
Table 1 Survey one - First Question

When looking at all the production lines together, "rather enlightened" scores the highest ratio, or 39%. The casthouse operators consider themselves the most enlightened, the production line scoring highest in both "very enlightened" and "rather enlightened". The

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[6] *256 production operators work the production lines, 218 answered the first questionnaire: 110 potroom operators, 75 casthouse operators and 31 rodding shop operators.*

rodding and the potrooms show similar results. The rodding scores higher in "rather enlightened" but the potrooms score higher in "very enlightened". The potrooms and the rodding also have similar scores in "rather unenlightened" and "very unenlightened". Even though they have already finished the implementation, the rodding scores highest in the "very unenlightened" criteria of all the production lines.[7]

Question 2 - What is your opinion of SDWT?
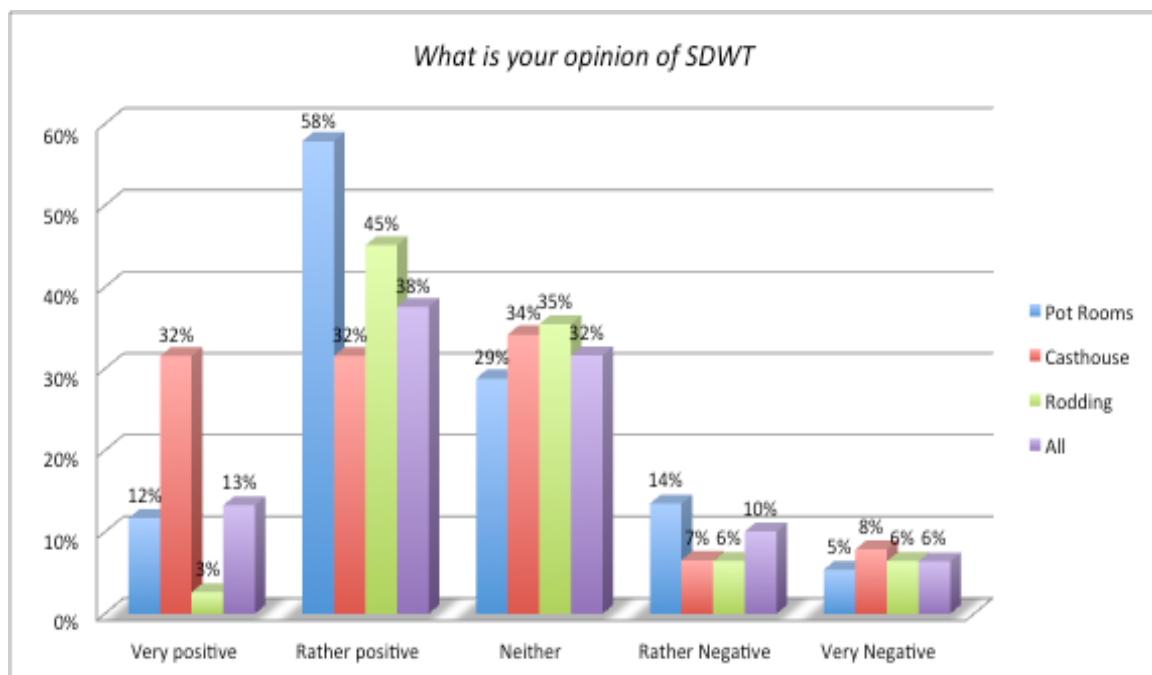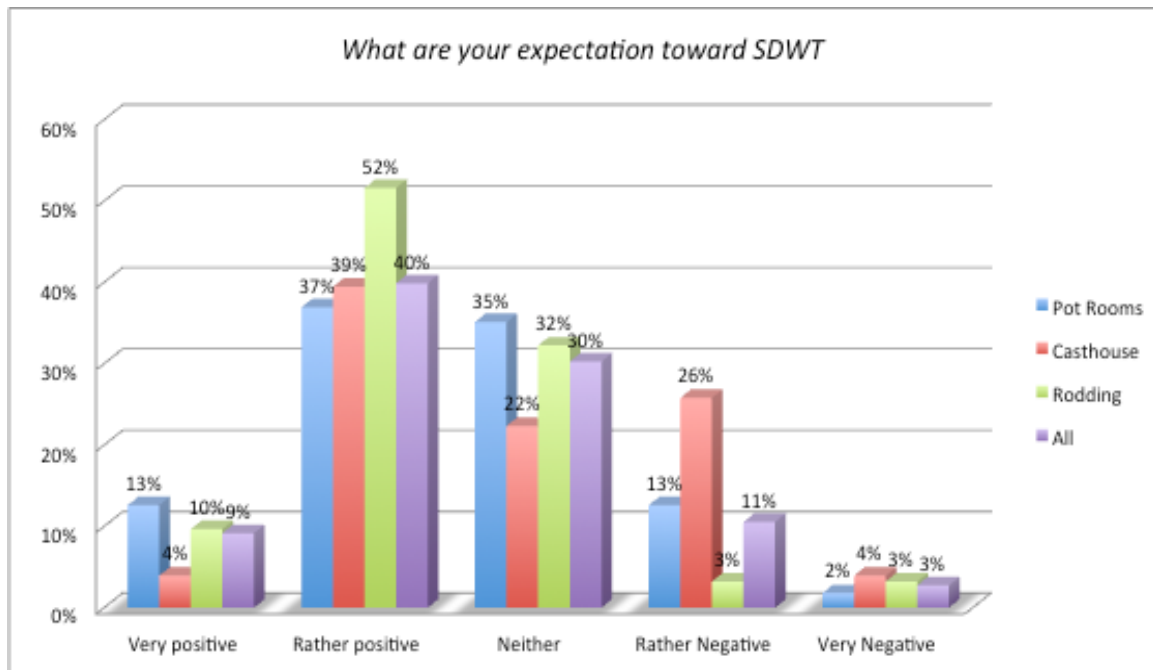

Table 2 survey one - Second Question

When looking at the production lines together, "rather positive" scores the highest percentage or 38%. The majority of the casthouse operators, who considered themselves the most enlightened of the production line operators, score highest of all the operators in "very positive" or 32% and score the same percentage in "rather positive".

Looking at the results in whole it can be seen that the casthouse operators are the most positive towards SDWT. The potrooms score highest in "rather positive" or 58% followed by "neither" with 29%. The potrooms score highest of the production lines in "rather negative"

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[7] This can be due to the large number of new production operators who have been replacing operators with longer periods of employment and who have quit or been transferred in recent months as a result of a change in the shift system.

with 14%. The rodding, the only production line that has completed its implementation, shows similar results to the potrooms.

Question 3 – What are your expectation toward SDWT
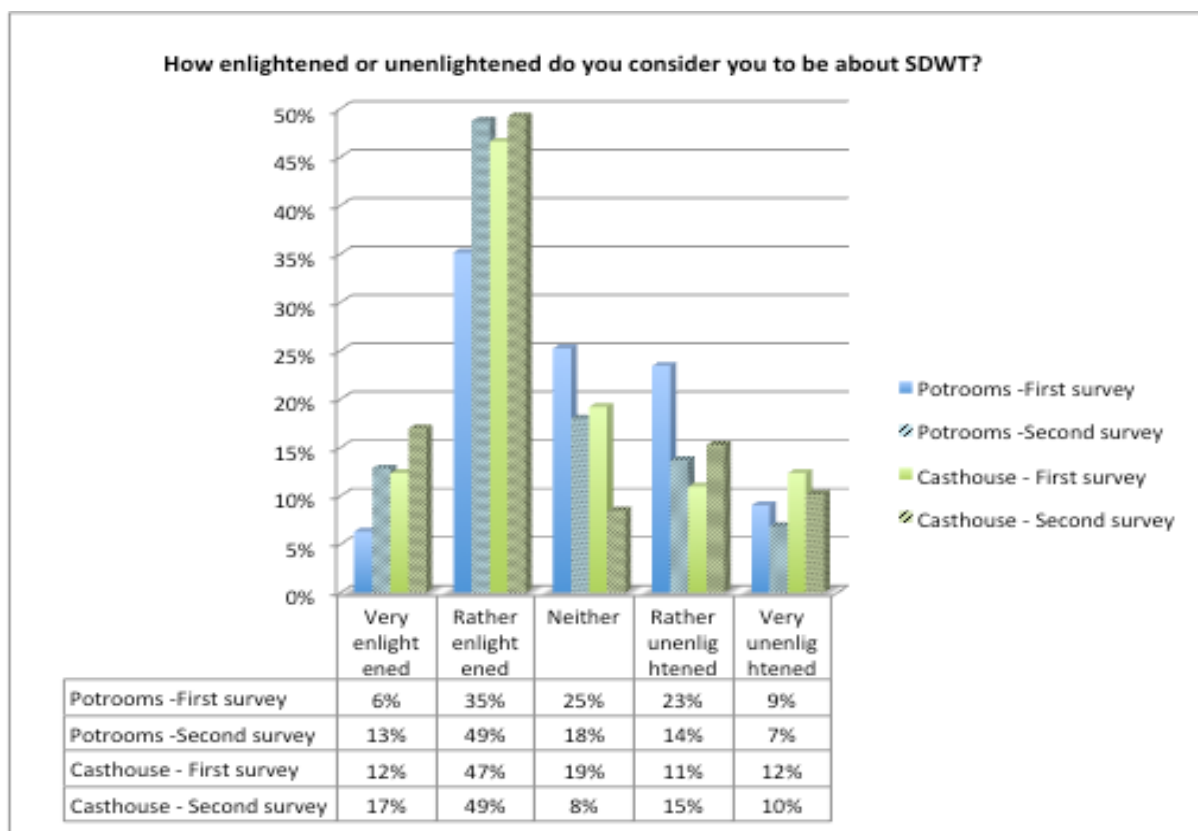

Table 3 survey one - Third Question

When looking at the production lines together, "rather positive" scores the highest percentage or 40%. The operators of the casthouse, who scored highest in the previous two questions, now score the highest in "rather negative " and "very negative"and have the most negative expectations towards SDWT of all the production line operators. The rodding, the only production line fully implemented, has the most positive expectations towards SDWT. The potrooms score highest in " rather positive" and "neither".

4.2 The Second questionnaire survey

A total of 75%[8] of the operators of the potrooms and casthouse answered the second questionnaire. Within the two production lines, the answering ratio was as follows: The potrooms 91% and casthouse 67%.

Question 1 - How enlightened or unenlightened do you consider you to be about SDWT?

	Very enlight ened	Rather enlight ened	Neither	Rather unenlig htened	Very unenlig htened
Potrooms -First survey	6%	35%	25%	23%	9%
Potrooms -Second survey	13%	49%	18%	14%	7%
Casthouse - First survey	12%	47%	19%	11%	12%
Casthouse - Second survey	17%	49%	8%	15%	10%

Table 4 survey two – First question

The result of question one is that "rather enlightened" has the highest ratio. There is a definite increase in knowledge, both in the potrooms and the casthouse. It can be seen that by looking at the increased ratio of both "very enlightened" and "rather enlightened", as well as looking at the decreased ratio of "rather unenlightened" and "very unenlightened".

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[8] 117 operators from the potrooms and 59 from the casthouse. The combined number of production line operators of the potrooms and casthouse is 216.
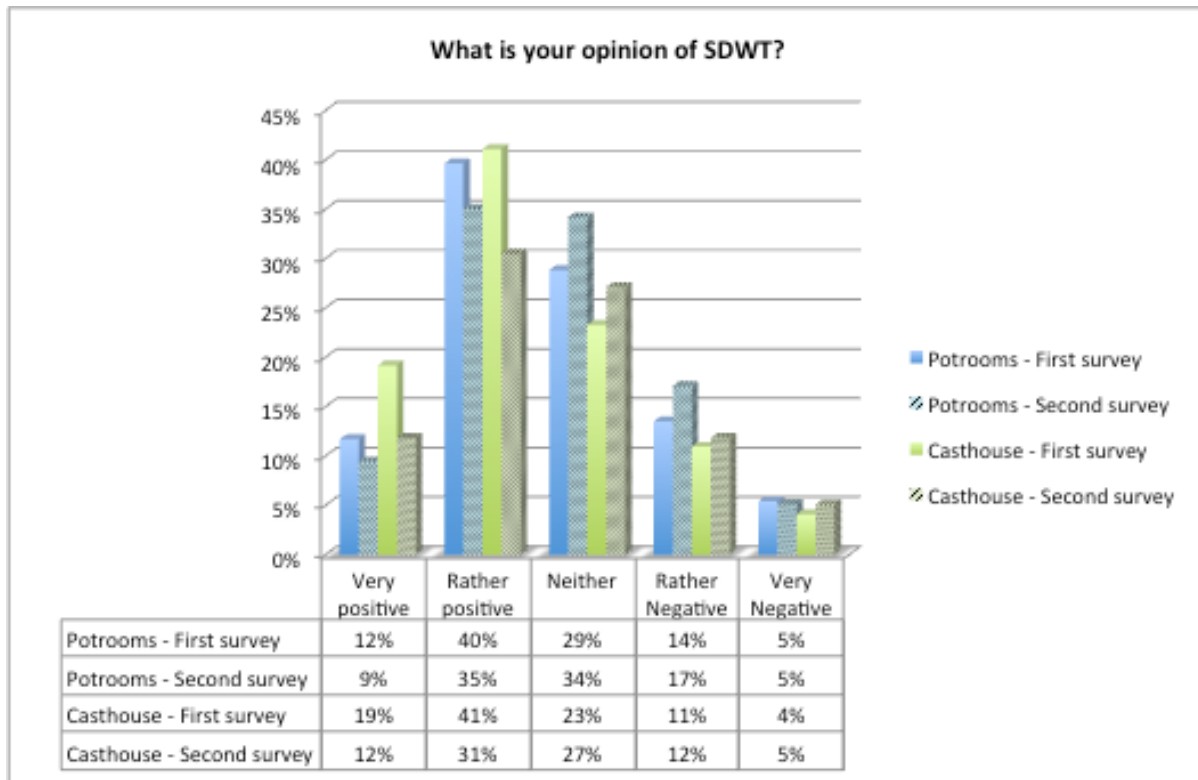
Question 2 - What is your opinion of SDWT?

What is your opinion of SDWT?

	Very positive	Rather positive	Neither	Rather Negative	Very Negative
Potrooms - First survey	12%	40%	29%	14%	5%
Potrooms - Second survey	9%	35%	34%	17%	5%
Casthouse - First survey	19%	41%	23%	11%	4%
Casthouse - Second survey	12%	31%	27%	12%	5%

Table 5 Survey two – Second Question

The results of question two are that the opinions of the operators are more negative in the second survey than in the first one. "Very positive" and "rather positive" has an decreased ratio and "neither"; "rather negative" and "very negative" have an increased ratio. The potrooms and the casthouse show very similar results.
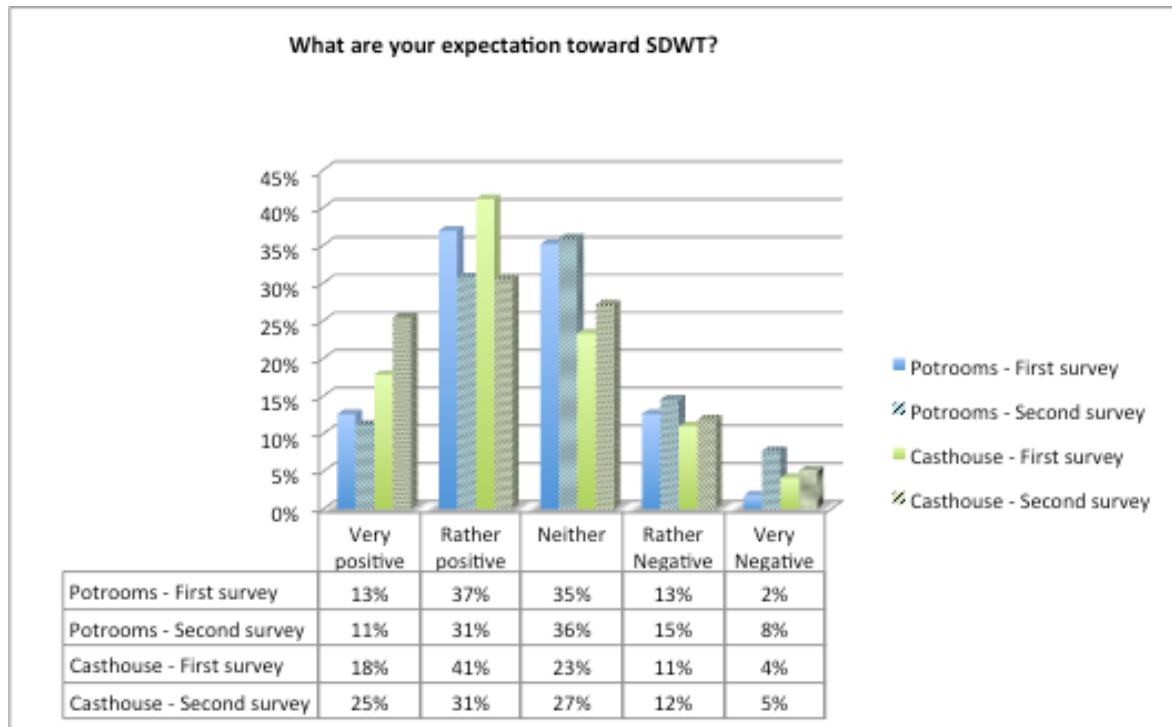
Question 3 – What are your expectation toward SDWT?

What are your expectation toward SDWT?

	Very positive	Rather positive	Neither	Rather Negative	Very Negative
Potrooms - First survey	13%	37%	35%	13%	2%
Potrooms - Second survey	11%	31%	36%	15%	8%
Casthouse - First survey	18%	41%	23%	11%	4%
Casthouse - Second survey	25%	31%	27%	12%	5%

Table 6 Survey two – Third Question

The results of this question are that both production lines show a decrease in ratio in " rather positive" as well as an increase in "neither", "rather unenlightened" and "very unenlightened".

4.3 The research results

The results of the first survey show that the production line that considers it self to be the most enlightened production line, the casthouse, has the least expectations towards SDWT. The potrooms, that had just begun their implementation process, are rather positive/enlightened in all of the three questions. The rodding, which has finished its implementation, has the highest expectations of all the production line operators towards SDWT. It would be expected that the production line, which has finished its implementation, would score the highest ratio in question one, *How enlightened or unenlightened do you consider you to be about SDWT?,* but the rodding is very similar to the potrooms, which was the last production line to start the implementation process. This indicates that the

experience that the rodding has gained by working in SDWT over the last year is having a large impact on the operators' expectations.

The results of the second survey show that in question one, *How enlightened or unenlightened do you consider you to be about SDWT?,* that the potrooms have now matched the casthouse in being "rather enlightened" or "very enlightened". That means that the seminar that was given between the surveys did have a positive effect on the potrooms' results but the casthouse considers themselves to have the same knowledge before and after the seminar. This might be explained by the fact that the implementation process was further along in the casthouse than in the potrooms.

The results from question two, *What is your opinion of SDWT?,* shows that both the potrooms and the casthouse are showing an increase from the former survey in the ratio "rather negative" and "very negative" and there is also a decrease in "very positive" and "rather positive" The potrooms and the casthouse show very similar results. The conclusion we can make is that with increased knowledge, the operators' opinions changed for the worse. In whole, the two production lines are scoring highest in "neither" and "rather positive", giving us the conclusion that even though there is an increase in negative opinions, the majority of the production line operators are positive towards SDWT.

The results of the third question, *What are your expectations toward SDWT?,*
are that the potrooms and the casthouse are showing a decreased ratio in " rather positive" as well as an increase in "neither", "rather unenlightened" and "very unenlightened". The casthouse shows an increase in "very positive", going from 18% to 25%. The potrooms show a little decrease in "very positive", going from 13% to 11% and there is an increase in "very negative", from 2% to 8%. The conclusion from the results of this question is that part of the production operators have become more negative towards SDWT after the seminar was given. The main conclusion is still that the majority of the operators are positive or have no opinion of their expectations towards SDWT.

5. Discussion and Conclusion

It is a matter of consideration that the operators of the rodding consider themselves to have the least knowledge of all the production operators, even though they have finished their implementation. This could be explained by the fact that there had not been as much training and preparation in the rodding as in the casthouse and potrooms. Other factor could be the increased number of new employees due to a change in their shift system; employees that had not received proper training when the first survey was done. Even though they consider themselves to have the least knowledge, the operators of the rodding have the most positive expectations of all the production lines towards SDWT, which might indicate that experience can have a larger effect on opinions than the information provided.

The results of the second survey show change in the answer ratio to all the three questions among the operators of the casthouse and potrooms. The results show an increase in negative answers and a decrease in positive answers. In the three months that passed between surveys, the operators have both received more information and the experience of working in SDWT. A majority of the operators still stays positive in all the questions, but the increase in negative answers might suggest that some employees are starting to object to the SDWT system and are starting to show resistance, which is normal in the final stages of implementation.

As to the research questions:

1.) How can increased knowledge affect the opinions of employees?

As shown in the results, the increased knowledge that was given during the SDWT seminar along with the operators' first experiences of working in SDWT did affect their opinions and expectations. A small increase in negative answers occurred. Whether that is directly connected to the seminar that was given cannot be said. Some of the information that was provided in the seminar did not go well with some of the operators. Negative attitudes have been noticed towards SDWT due to amont other things the amount of money payed to operators taking on the extra responsibility due to SDWT.

Also, during the months that passed between the surveys, downsizing[9] had to be made by the aluminum plant since they themselves were facing a severe reduction in their production of aluminum due to trouble obtaining enough electricity for their production. The plant's losses due to this reduction were millions of dollars. The plant had also been sustaining losses due to the low prize of aluminum on markets. All this occurred during the implementation process. Therefore operators could be blaiming the implementation of SDWT for the what they considered to be negative changes to their work environment due to downsizing within the plant. Still the majority of the operators stayed positive towards SDWT.

2.) How did the increased knowledge influence the implementation process?

Whether the additional information given in the seminar is the cause for the increase in negative answers or not, the results strongly indicate that a part of the production operators have started to object to this new change and are beginning to resist it. This can make the adjustment to SDWT more difficult, especially since a small number negative opinions can spread and increase in number. Resistance among employees is a normal development in the change process according to change management.

What can the aluminum manufacturing plant gain from the results of this case study? The case study indicates that a resistance has begun to form among the operators. Resistance to change has been the subject of many scholars. According to Harold Kerzner (2009) it is imperative for the project manager and implementation team to understand why there is resistance to change. Following this research one might want to investigate and find what it is that is the operators are resisting and why are they resisting it? In *Imaginization; New Mindsets for Seeing, Organizing and Managing*, Gareth Morgan writes:

> A manager, change agent, consultant, or anyone who wishes to help organizations achieve new forms will usually encounter these blocks in one way or another. The challenge is to be aware of their existence, to recognize the different form that they can take, and to find ways of dealing with them. (p.173)

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[9] There was no change in the number of production line operators.

It is important to make sure that the production line operators fully understand what they are taking on by being a member of SDWT. If the employees are happy in their current working arrangement there will be a resistance to the change. Also if the operators do not know the job he or she is supposed to take on when becoming a member of SDWT they can also start to resist. According to Kerzner (2009): "the worst case scenario is when employees are asked to undertake new initiatives, procedures, and processes that they do not understand (p.79). Therefore the project manager and her team must keep a close eye on the development of SDWT teams in coming months and react to it.

In one of his articles, John P. Kotter (1995) writes about the *Eight Steps to Transforming your Organization* and what the most common failures are when implementing big changes. These eight steps are the same as the *Eight Stages* mentioned above, only here he details what can go wrong in each step. When the implementation process was looked at through John P. Kotters *Eight Stage Process* it became clear that the plant has not yet entered stage eight since the implementation just finished. What Kotter advices companies in stage eight is:

> Use increased credibility to change systems, structures, and policies that don´t fit the vision. Hiring, promoting, and developing employees who can implement the vision. Reinvigorating the process with new projects, themes, and change agents (Kotter, 1995:p61)

According to Kotter most people are not willing to take the leap unless compelling evidence has been introduced that the changes will produce the expected results. He also writes that a commitment to short-term wins can help with keeping up the urgency level and can clarify or revise the vision (p.66). This should one of the things that the project manager and her team should focus on

Susan Lee (2014) writes that resistance is healthy for companies and that understanding the resistance will help companies to clarify what they are doing. Companies are not supposed to react defensively towards resistance but rather try to anticipate the resistance. In her article (2014) she gives following advice on how to handle resistance:

1. Involve interested parties in the change process by asking them for suggestions and implement their ideas.

2. Be sure that the need for change is known to employees. This can be done by communicating strategic decisions both personally and in written form.

3. Address the needs of people. Disrupt only that which needs to be changed. Try to keep comfortable settings and group norms wherever possible.

4. Integrate flexibility into the change process by phasing it whenever it is possible. This will allow the people to assimilate new behaviors. Allow the employees to redefine their roles during the course of the implementation process.

5. Be open and honest

6. Do not leave openings for people to return to the status quo. The organization must be ready to commit to the change.

7. Focus always on the positive aspects of change.

8. Deliver training programs that will develop basic skills for communication, team building, self-esteem building and coaching.

When this research was conducted, the aluminum plant was facing severe difficulties that unfortunately occured at the same time as the implementation process entered its final stages. Extra measures should therefore be taken by focusing on the positive things that are happening in the company instead of the negative things. Team building meetings, along with even more training, could also help the employees to make the transition from resisting to accepting.

7. Acknowledgements

References

Allender, Hans D. *Self-Directed Work Teams: How far is too far?* Retrieved april 20, 2014, from:
http://www.thefreelibrary.com/Self-directed+work+teams%3A+how+far+is+too+far%3F-a014555397

Armstrong, Michael. (2009). *Armstrong´s Handbook of Human Resource Management Practice* (11th edition). London: Kogan Page.

Babcock, Barbara. *Dealing with redundancy*. Retrieved April 24, 2014, from
http://www.graftonhaymes.co.uk/2012/03/27/dealing-with-redundancy-by-barbara-babcock/

Cameron, Esther and Green, Mike. (2009). *Making Sense of Change Management; A complete guide to the models, tools & techniques of organizational change* (2nd edition). Great Britain: Kogan Page.

Colvin, Geoff. (2012). The Art of the Self-Managing Team. *Fortune*, vol. 166 (9), p.22.

Douglas, Ceasar and Gardner, William L. (2004). Transition to Self-Directed Teams: Implications of Transition Time and Self-Monitoring for Managers´s Use of Influence Tactics. *Journal of Organizational Behavior*. Vol. 25 (1), pp. 47-65

Fisher, Kimball (2000). *Leading Self-Directed Work Teams; A Guide to Developing New Team Leadership Skills*. New-York: McGraw-Hill

Kerzner, Harold. (2009). Project Management; A systems approach to planning, scheduling, and controlling (10th edition). Hoboken, NJ: John Wiley & Sons, Inc.

Kotter, John P. (2012). *Leading Change*. Boston: Harvard Business Review Press.

Kotter, John P. (1995). Leading Change: Why Transformation Efforts Fail. *Harvard Business Review*, March-April edition, p.59-67.

Lee, Susan. *Managing resistance to change*. Retrieved April 24, 2014 from:
http://www.graftonhaymes.co.uk/2012/03/27/dealing-with-redundancy-by-barbara-babcock/

Manz, Charles C. and Sims, Henry P. (1987). Leading Workers to Lead Themselves: The External Leadership of Self-Managing Work Teams. *Administrative Science Quarterly*, vol 32, pp. 106-128.

Mumby, D. K. (2005). Theorizing resistance in organization studies: A dialectical approach. Management Communication Quarterly, 19, 9-44.

Moravec Milan. (1999). Self-Managed Teams. *Executive Excellence*, vol 16 (10), p.18.

Morgan, Gareth. (1997). *Imaginization; New Mindsets for Seeing, Organizing and Managing.* San Francisco: Berrett-Koehler Publishers, Inc.

Petty, G.C., Lim, D.H., Yoon, S.W. and Fontan, J. (2008). The effect of Self-Directed Work Teams on Work Ethic. *Performance improvement quarterly,* vol. 21 (2), pp. 49-63.

Roper, Kathy O. and Philips, Deborah R. (2007). Integrating self-managed work teams into project management. *Journal of Facilities Management,* vol. 5 (1), pp. 22-36.

Tjepkema, Saskia. (2003). *The learning infrastructure of self-managing work teams*, Enschede Holland: Twente University Press.

Yeatts, Dale E. and Hyten, Cloyd. (1998). *High-Performing Self-managed Work Teams; A Comparison of Theory to Practice.* California: Sage Publications.

Appendix 1- the implementation process

Tables seven and eight show changes that were made to the plants production line hierarchy and working arrangement before and after the implementation process of SDWT:

Before Implementation						
Production Line	Number of employees	Coaches	Coaches workhours	Team Leaders	Operation stations/teams	supporting roles pr shift
Casthouse	88	4	12 hour night and day shifts	6	6	0
Rodding	44	4	12 hour day shifts	4	5	0
The Potrooms	124	8	12 hour night and day shifts	8	9	0

Table 7 Before implementation

After Implementation						
Production Line	Number of employees	Coaches	Coaches workhours	Team Leaders	Operation stations/teams	supporting roles pr shift
Casthouse	88	4	8 hour weekdays	0	6	10
Rodding	44	4	8 hour weekdays	0	5	10
The Potrooms	124	4	8 hour weekdays	0	5	10

Table 8 After implementation

The number of production lines operators stays the same before and after the implementation. The number of coaches will stay the same with the exception of the potrooms where instead of two coaches per shift, one for each potroom, there will be one coach per shift. Instead of the operators being in two separate teams working in each potroom (A and B) there will be one team, working in both potrooms together. One of the many purposes of the shifts becoming Self-Directed is among other things so that the coaches will be able to focus more on the operators of the their shift and the teamwork. In research that was done before the implementation process began, 16% of the coaches said that they had too little time to work on building up their team properly and 46% said that they did not have enough time to focus on safety matters. By implementing SDWT the aluminum plant is hoping that the coaches will have more time to focus on their operators and safety matters (A. Gunnarsdóttir, Personal Communication, January 12, 2014).

The job "Team Leader", the coaches- second-in-command and often their substitute, was removed. Instead, 7 "extra roles" were implemented. All the operation areas have five

supporting roles. On top of that, the potrooms have one area-specific role in environment control and the casthouse has its specific one; quality control. In the seminar that was given to the operators of the casthouse and potrooms before the second survey, the project manager introduced to the operators, among other things, this new working arrangement. According to the plan these extra roles should account for 20% of the operators work load on the shift; also, the operator will be given en extra pay per shift for undertaking the extra role. The extra roles will rotate among the operators every 6-18 months. Each extra role will increase the team's knowledge and responsibility in supporting tasks, some of them taking on a small part of the coaches' and the teamleaders' former responsibilities. The supporting roles include tasks in training, manning, process control, improvement projects, equipment wellness, housekeeping, environment, health and safety.

The operation stations stay the same in the casthouse and the rodding shop but will go from nine to five in the potrooms. This reduction was done by merging separate but co-working operation stations into teams. Each team will be, when fully implemented, completely self-managed.

Appendix 2 – The A3´s