VAASAN AMMATTIKORKEAKOULU
UNIVERSITY OF APPLIED SCIENCES

Varpu Pajukoski

DEVELOPING A MORE EFFICIENT AFTER SALES PROCESS

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VAASAN AMMATTIKORKEAKOULU
International Business

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Globalisaatio, tietoverkkojen kehitys, lisääntynyt liikkuvuus sekä monet muut tekijät ovat muuttaneet merkittävästi organisaatioiden toimintaympäristöä vuosien saatossa. Jotta uusiin haasteisiin voidaan vastata tehokkaasti, tulee päivittäisen tekemisen olla sujuvaa ja tehokasta. Tämän opinnäytetyön tarkoituksena on kartoittaa ABB Oy Muuntajien jälkimarkkinointiprosesseja sekä niissä esiintyviä haasteita, jotta nykyisiä prosesseja voidaan tehostaa ja tehdä niistä vakaampia.

Teoreettinen viitekehys rakentui prosessin kehittämisen ympärille. Prosessin kehittämisen lähtökodaksi tarkentui itse prosessi ja sen määritelmä, josta oli luontevaa jatkaa prosessin kehittämiseen ja sen eri vaiheisiin. Lisäksi korostui prosessin mallintaminen ja jatkuva parantaminen, jotka ovat tärkeä osa prosessin kehittämistä.

Tutkimuksen aikana paljastui useita ongelmakohtia. Suurimmat ongelmat liittyivät tiedonkulkuun sekä selkeiden toimintamallien puuttumiseen, joka puolestaan aiheutti epävakautta prosessissa. Koska jälkimarkkinoinnin resurssit ovat rajalliset, oli erityisen tärkeää keventää prosesseja mahdollisuuksien mukaan. Tämän työn puitteissa tehtiin uudet prosessikuvaukset, joilla pyrittiin selkeyttämään prosesseja. Uudet prosessit otettiin käyttöön vuonna 2013, mutta parhaan hyödyn saamiseksi ne vaativat jatkuvaa parantamista. Prosessinkuvauksia tulisi jatkossa päivittää tarpeen mukaan ja muuttaa tarvittaessa olemassa olevia käytäntöjä.

Avainsanat	Prosessi, prosessin kuvaus, prosessin kehittäminen, mallinnus, jatkuva parantaminen

VAASAN AMMATTIKORKEAKOULU
UNIVERSITY OF APPLIED SCIENCES
International Business

ABSTRACT

Author	Varpu Pajukoski
Title	Developing a More Efficient After Sales Process
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Name of Supervisor	Kim Skåtar

Globalization, the evolution of information networks, increased mobility and many other factors have caused fundamental changes in organizations' operating environment. In order to respond effectively to new challenges it is important that daily operations are run smoothly and efficiently. The aim of this thesis was to examine ABB Oy Transformer's after sales processes and to find out the challenges in order to make the processes stable and more efficient.

The theoretical framework was built around process development. To be able to understand process development, the starting point of the theoretical framework was process and its description. After that process development and its phases were explained. Also, process modelling and continuous improvement were emphasized as they are important elements in process development.

During this study several problems in the existing process descriptions were found. The biggest problems were related to information flow and lack of clear practices. As after sales resources were limited it was important to streamline processes as much as possible. Within this study new process descriptions were carried out in order to clarify process flows. New processes were introduced in 2013 but they require continuous improvement. When necessary the process descriptions and the existing practices should be updated.

Keywords: process, process description, process development, process modelling, continuous improvement

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1 INTRODUCTION

The operating environments of organizations' are undergoing fundamental changes due to globalization, increased mobility, e-business models, new productivity requirements as well as evolution of information networks and digitalization. This has increased the importance of competence, speed, flexibility and innovativeness. This kind of complexity has made organizations to become more specialized and to focus their know-how on smaller areas. (Laamanen & Tinnilä, 2009)

Process modeling and development has been an essential means of improving company's performance since the 1970's. Process thinking has been a central part of Japanese quality philosophy for decades and it has also had a strong influence on western production operations. It can be applied to almost every private business, to public administration as well as to non-profit organizations to increase their performance. (Martinsuo, M. & Blomqvist, M., 2010, 3)

The key features of process thinking are systematic thinking, issue-centered thinking, goal orientation, focusing on value adding actions, utilization of feedback as well as systematic improvement of the performance by improving the process. Process thinking is often related to removing the unnecessary work and making the work more efficient. Sometimes process thinking can also highlight tools, documentation and information systems since they are important ways of spreading the practices and automate work phases. (Martinsuo, M. & Blomqvist, M., 2010, 3)

Even though the goals are quite the same, the means of how to achieve the goals are different from those used previously. Hard personal goals have been changed to organization-wide co-operation and emphasis on team-work. The focus on cost-effectiveness has been expanded to cover also speed and flexibility. The relationship between the supplier and the customer has changed – before suppliers had to compete for bids and the customers were seen as a necessary sales targets whereas now they are partners in a value-creating network. (Laamanen & Tinnilä, 2009, 7)

The main aim of this study is to find out how a process can be improved and what the effects are in real life. In today's world we are forced to find out better practices to be competitive. By improving processes we are able to create steadier processes with less errors and also to reduce costs which is very important factor in today's business world as well. I am choosing this topic because I have worked for a case company and seen the problems in its every day operations. It seems that by improving the process it could be possible to improve the flow of information and to make the work easier and more transparent. This could help several departments, shorten lead times and make the process steadier. Unnecessary work could be avoided and even customer satisfaction could be eventually increased.

1.1 Problem Statement

The research problem is to improve the case company's after sales process. In order to solve this problem, the following plan is made. The first objective is to examine the existing processes and examine how well the existing process charts describe the current situation. This is done by working in group gathered from different departments and also by conducting interviews. The second objective is to analyze sales statistics and to find out what tools and resources are available. By examining this data it will be possible to find out some areas of improvement. The third objective is to set the target state and see what kind of changes should be made in order to reach the target state. Finally, the changes will be implemented in practice.

1.2 Structure of the Study

The theoretical study is divided into four main sections. The first section is about the process; what the process is and how it can be divided into different groups. The second section is about process development. It shows the principles of process development as well as finds out why the process is going through changes, how the changes should be made and what the goals are. The third section reveals what process modeling is and why and how to model a process. The final section, continuous improvement, is an important area of process development so that the improvements are made also in the future and the process is developed further as

time goes by. The steps and benefits of continuous improvement will be shortly presented.

The empirical study introduces shortly the case company followed by the process improvement process in the case company. This will give an overview of how the improvement process was carried out and what kind of changes were made. The process charts and forms are attached to this study. Thoughts about new processes, problems and ideas for the future can be found following the empirical part study.

2 PROCESS

In this chapter a basic description of a process is introduced. This will give the basic knowledge on what is meant by process and how it can be divided into smaller areas like for example core and support process or current and target process.

2.1 Description

Any activity or change can be described as a process. Process is a set of logically related activities and resources which are used to transform inputs to outputs. (Laamanen & Tinnilä 2009, 121-122) It is an entity that is assembled from multiple actions and tasks and it is a way of working efficiently and seamlessly in order to fulfill a customer's needs. (Laatujohtamisen tiimi 2009, 2)

Process is a chain of actions that creates added value to the customer and in which a company uses its resources. A customer can be an internal or an external customer, known or unknown but there are always expectations, needs and demands from the customer towards the process. (Martinsuo & Blomqvist 2010, 4) A process can go from customer to customer crossing departmental and organizational boundaries. (Laamanen & Tinnilä 2009, 121-122) Pocess creates added value to the inputs when transforming them into outputs. Added value is related to the customer's expectations, needs or demands and as an output it can mean, for example, a product, a solution or a service. (Martinsuo & Blomqvist 2010, 4)

Process may involve any part of the company's business or other organizations' activities seeking for benefits; creation of new innovations, production, products and services, finance or customer relations etc. (Martinsuo & Blomqvist 2010, 3) In a process the value adding action is formed from several actions connected to each other. The chain of actions can be simple or complicated, pre-determined or un-determined. Resources like raw material, labor, capacity, money, equipment or information are needed in the process. Resources can be owned by the company or acquired externally but they always cause costs and the resources available are limited. (Martinsuo, M. & Blomqvist, M., 2010, 4)

The basic elements of efficient processes are functional processes, efficient production equipment as well as advanced practices. Operational excellence is built on these factors and it aims at a work culture where problem solving, development and an innovative mindset are seen as an asset. (Jatkuva Parantaminen ABB Oy:ssa 2005, 5)

The process starts from the customer's needs and ends after the needs have been fulfilled (Laatujohtamisen tiimi ABB Oy 2009, 2). The relationship between the customer and the company is extremely important. In the business world the interest is mainly in those processes which are critical to success. These processes are known as key processes, business processes or main processes and are often presented by using process charts. (Laamanen & Tinnilä 2009, 121-122) It is very important for companies to lead and guide their processes in order to reach their objectives (Martinsuo & Blomqvist 2010, 5).

2.2 Process Division

Especially in the business world there is a difference between *process* and *business process*. Business process describes those processes which are used to make money whereas process can describe any process. (Martinsuo & Blomqvist 2010, 3) This study deals with processes in general.

2.2.1 Core and Support Process

Processes can be divided into core and support processes. Core processes are always connected to external customer whereas support processes are internal and support core processes. Different level processes are called main process, sub process and part process. The main process can be divided into several sub or part processes and in that way it can be modeled on several levels. (Martinsuo & Blomqvist 2010, 4)

Porter's value chain (Porter 1985, 87), presented below in Figure 1., shows the core and support processes. The core processes are flowing across the bottom of the figure whereas the support processes are layered above them. Together they form the margin. (Harmon 2011)

In practice this means that a core process proceeds from one core process to another creating value to the customer. Support processes layered on the top help the core processes to function. This can mean, for example, hiring new employees or implementing new software to help sales department.

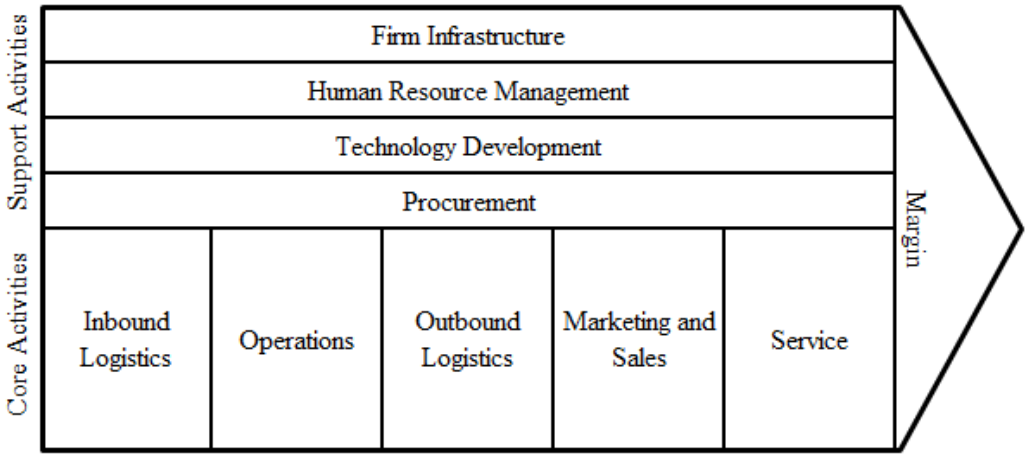

Figure 1. Porter's Value Chain.

Another way of illustrating the relationship between a core and a support process can be seen below in Figure 2. The yellow boxes represent the core process and thte grey boxes the support process. The support processes, like maintaining a database or negotiating labor contracts, are happening in the background but they are very important for the success of the core process. Core processes create value straight to customer by delivering the product. This is just a simple example of how important it is to pay attention to both processes.

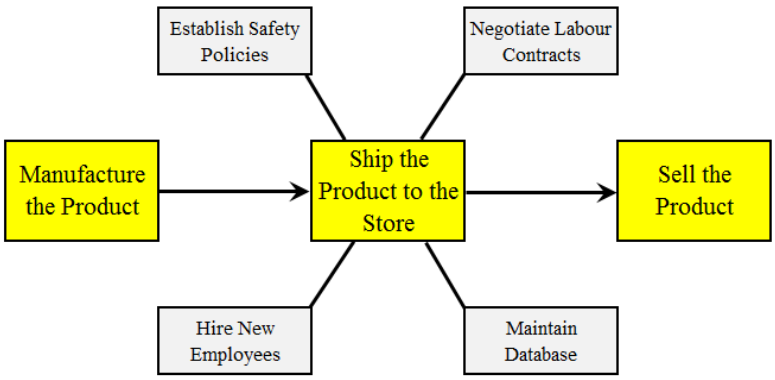

Figure 2. Relationship between core and support process.

Core processes are critical to a company's success. (Martinsuo & Blomqvist 2010, 9) They deliver value straight to the external customer. These kinds of processes are for instance product development and order-delivery process where the products and services are delivered to an external customer. Core processes generate the company's cash flow and are vital to the company's survival. (Laatujohtamisen tiimi 2009, 2) To enable the core processes, the organization must also have support processes (Laamanen & Tinnilä 2009, 121-122).

Support process is critical for the functionality and improvement of the core process. Processes that support core processes are, for example, strategic planning, financial planning and information systems maintenance. (Laatujohtamisen tiimi ABB Oy 2009, 2.)

A core process can be divided in to sub processes. As an example a sales process can be separated from the order-delivery process. A key process, on the other hand, can be core, support or even sub process but it is always an essential process for the company's success. (Laatujohtamisen tiimi ABB Oy 2009)

2.2.2 Current and Target Process

A current process describes the current situation and a target process describes the process as it should be in order to fulfill the goals of performance. The difference between a current process and a target process shows the concrete changes that should be made in order to reach the target. (Martinsuo, M. & Blomqvist, M., 2010, 4)

3 PROCESS DEVELOPMENT

Process development is a wider concept that includes process improvement. This chapter introduces the basics of process development and improvement. The development process is led by process owners who are in charge of development, whereas the involvement of employees is more important in process improvement. In this chapter, also the goals and reasons behind the changes are discussed as well as typical areas of improvement.

3.1 Description

Process development begins by understanding the process. Even the hardest work is not enough if the entity is not in control and processes are unclear. A functional process requires continuous listening of the customer, common goals and measurements in the organization, fluent flow of information and material, well planned, instructed and trained actions, quick response to changing conditions and know-how. (Laatujohtamisen tiimi 2009, 4-5)

The aim is to change the process so that it becomes more effective and it focuses directly on action. People are not expected to do more but to do things differently. (Laamanen & Tinnilä 2009) Tasks are done in their natural order and place. Loops, waste and work in progress are minimized so that work would be smooth, clear and as fast as possible. (Martinsuo, M. & Blomqvist, M., 2010, 14)

Process development includes both process modelling, and process improvement and measurement. Process modelling produces process descriptions which can describe either the current or the target state. Current state descriptions show the current ways of working and how different functions and tasks work together whereas target state descriptions works as a plan for creating and implementing new ways of working. Process development must to be aligned as a part of organizational development. (COALA, 1.2.2014)

A customer can be internal or external but the customer always values on-time deliveries, high-quality products and services and, of course, a competitive price. This makes reliability and fluent processes high in priority. In Figure 3. unclear and

clear processes are demonstrated; on the left side there is an unclear process and on the right side there is a clear process. (Laatujohtamisen tiimi 2009, 4-5.) By streamlining the process, the steps are done in a logical order and unnecessary loops are removed. It is easier to control a clear process and the number of errors caused by confusion is reduced. This will also reduce unnecessary work which, again, will help to reduce costs.

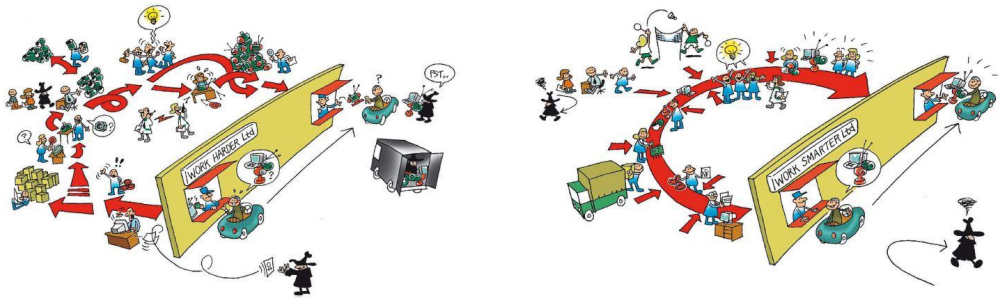

Figure 3. Unclear and clear process. (Laatujohtamisen tiimi 2009, 4-5.)

Process development should be led by process owners, who are in charge of development, whereas the involvement of those working according to the process is necessary in process improvement. Even small ideas can be utilized to significantly reduce errors and remove bottlenecks. However, it is recommended that process development should be handled in a form of a project to avoid the work remaining as nothing more than a good intent. Training of participants is an essential element of implementing the improvement process. (COALA, 1.2.2014)

Process development should be seen as an investment that will eventually pay itself back. The real costs of process development should be considered because the change needs time and resources. By having good arguments that support the change it is much easier to justify the change and get employees to commit themselves to the change and reduce resistance towards the change. (Kollanus, S. 2014)

3.2 Two Models for Process Development

There are two types of changes: smaller changes in everyday actions and wider development projects. Smaller changes can be, for example, improving one area of

a process as well as continuous improvement. A development projects are usually bigger changes that require bigger investments. Development process starts when there is a problem that needs to be solved. (Kollanus, S. 2014) In the following two chapters two different approaches are presented.

3.2.1 Principles of Process Development by Moisio and Ritola

According to Moisio & Ritola (2005) there are four steps of process development and they are shown in Figure 4. The first step of process development is to identify the process. It includes grouping but also defining limitations that will help in seeing the process. If there are no limitations the process will be never ending and there will be problems in the next step which is process modeling. (Moisio & Ritola 2005, 6.)

Process modeling helps to see the process as a whole and how different parts of the process are linked to each other. The third step is to implement the process in daily operations. This phase needs to have full support from the management because it is important get the whole organization to commit to the change. (Moisio & Ritola 2005, 6.)

The fourth step is continuous improvement. The process can be developed even further by measuring, analyzing, evaluating and comparing information and experiences received from the implemented processes. After finding out the problems in the processes it is good to return to process modeling to fix the problems. (Moisio & Ritola 2005, 6.)

Figure 4. Steps of process development by Moisio and Ritola.

Principles of process development are shown in Figure 5. systematic process development model by Moisio and Ritola (2005). When developing a better process

there are a lot of factors to consider. It is important to listen to the customer, reduce unnecessary work, simplify the process and take advantage of the opportunities offered by the technology among others.

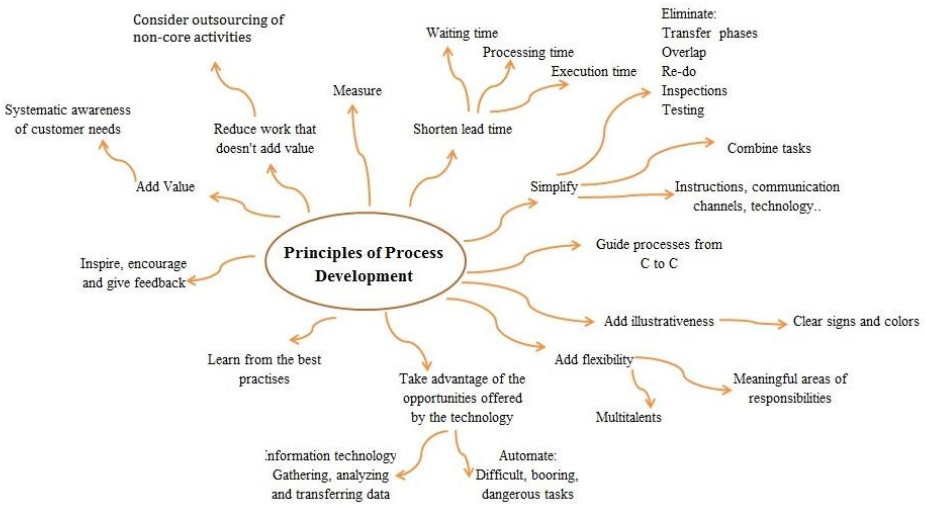

Figure 5. Systematic process development model by Moisio and Ritola (2005).

3.2.2 Principles of Process Development by Martinsuo & Blomqvist

Developing a company's performance through processes can mean extensive transition to process related approach, introduction of one new process, re-engineering or making smaller improvements to the existing processes. Even though these development methods are implemented differently, there are some basic steps that are similar and are shown in figure 6. (Martinsuo & Blomqvist 2010, 6)

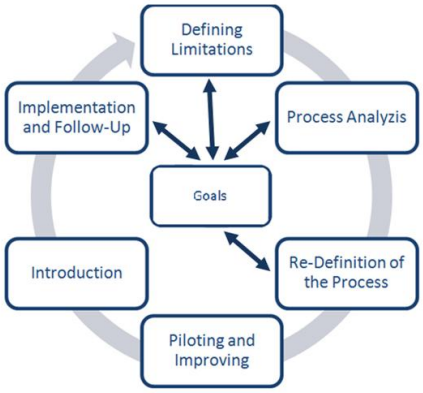

Figure 6. Steps of process development by Martinsuo & Blomqvist (2010).

According to Martinsuo & Blomqvist (2010) there are six steps of process development. Process development starts by setting proper limitations; which process to develop and what is it about. The existing processes might be helpful when deciding the limitations. Also, the company's goal plays an important role when defining limitations. (Martinsuo & Blomqvist 2010, 6)

After limitations are set the process analysis can be started. Reliable information and measures of the current process are needed. If the process is new information should be about how added value has been created before or how other companies do it. To gather information there are several methods to use including interviews, group assignments, analyzing of information databases, observing the process and simulating process modeling. Current situation should always be compared to the goals to see if the current process produces the right kind of results and to find out if there are any deficiencies. (Martinsuo & Blomqvist 2010, 7)

After the process analysis the areas of improvement are identified. Sometimes the whole process is re-defined starting from customer expectations and needs. Most of the times, however, the re-definition is only done for certain areas of the process like sub processes, connections between the processes or, for example, resources. The target process should be described as it should be implemented in order to reach the goal. (Martinsuo & Blomqvist 2010, 7)

Modeling the target state is followed by piloting. This means testing the process, either in modeled or real conditions, to monitor and support the process. This is also a great opportunity to make small changes and corrections. Piloting should be done before large scale implementation in the organization. Process can have extensive effects on a company's actions and it is not recommended to implement incorrect or incomplete process. Piloting helps to see if the developed process actually brings any real benefits or solves the problems that the old approach had. (Martinsuo & Blomqvist 2010, 7)

On the other hand, piloting is not always possible due to extremely complex process. Then it would be useful to test the process by asking opinions from other experts and the people who will be working with the new process. They might see if there are any shortcomings, areas of improvements or is the process even viable. (Martinsuo & Blomqvist 2010, 14)

Introducing a new process means that old practices, instructions and routines are replaced with new ones. Employees, possibly also customers, suppliers and other necessary people are trained to follow the new process and to find their own role in it. Measuring and monitoring systems are customized to meet the new criteria and connections to other systems are renewed. At this point it is very important to have consistent communication and have the management's support to guarantee the effective implementation of new approach. (Martinsuo & Blomqvist 2010, 7)

Process implementation and follow-up means implementing chain of actions from customer to customer in order to reach the company's goals and also systematic gathering of feedback for continuous improvement of the company. The process is guided and managed all the time so that someone is responsible for the resources, execution conditions and performance all the time. Because of monitoring and follow-up, smaller areas of improvement can be identified and fixed by using continuous improvement. (Martinsuo & Blomqvist 2010, 7)

3.3 Pressure to Change

Many times the pressure to change the process comes from the outside of the company. Pressure to change can be a result of a change in customer needs, competitor's new activities or investors demand for higher return on investment. (Laamanen & Tinnilä, 2009)

The various needs to develop a process have a variety of special features. When creating a completely new process in an environment where other processes are already in function the impulse can come, for example, from a new product or new way of delivering the product or service by using subcontractor. This might involve

new players and there might even be huge risks and uncertainties. In this case piloting plays an important role. (Martinsuo & Blomqvist 2010, 7)

When improving an existing process the impulse can come from people who are working with the process and find something to improve. Improvements can be small things or they might even be already adapted to the daily operations and just need to be updated to the process description. (Martinsuo & Blomqvist 2010, 8) Ideas for improvement are good. They describe personnel's know-how and ingenuity, as well as their commitment to the company. The amount of ideas also shows managers' ability to motivate the staff and their own attitude and ability to work in teams together with their staff. (ABB Group, 2013)

3.3.1 Typical Areas of Improvement

There are several indicators of an unstable process. Process measurements vary and are often used to measure details. Plans are changed whenever problems are faced but there are no clear procedures to follow. The process flow is unsteady and hard to predict. (ABB Group, 2013)

Typical areas of development are related to lack of investment in value-creating activities, wastage and wrong choices. Lack of investment in value creating activities can be for example using fewer resources than needed or otherwise disturbed resourcing and organizational settings. This can lead to a bottleneck effect that weakens the entire process. When talking about a bottleneck, it means that one part of the process works more slowly than the other which causes peaks in workload. Tasks might pile up and the next task cannot be started before the previous is done. Wastage means over resourcing, loss or useless waiting time. Subject of wastage can then be labor force, material, product, component or time. This weakens the performance of the whole process and will definitely increase unnecessary costs. Wrong choices appear in how the process works in relation to the company's goals and strategic decisions; is the process used correctly to support the company's strategy? (Martinsuo & Blomqvist 2010, 18)

As an example, inventory can tell a lot about a company. Standing inventory is a sign of a breakdown of one of the processes and does not mean customer satisfaction even though the goods are available. It is more likely to describe the situation where the company is not flexible enough to deal with the expectations. Standing inventory is a sign of a buffering problem which indicates that the supply chain is too slow to respond to the customer needs. Inventory can be seen as a red flag of supply chain problems as well as problems in customer service. (Plenert 2002, 399-400.) In such situations it should be considered how to improve the supply chain process and how to make it more flexible.

3.4 Goals

The basic question behind process management is how to create value for the customer. The core belief is that there is a certain chain of activities that can produce most value for the customer. When these activities are managed, they can produce operative result. An organization should create sufficient value for the customer in relation to costs. Sometimes it is problematic to know the customer needs since they might be subconscious. To create quality, products and services must be delivered on time and fulfill the promises made to the customer. The customer gets added value only after the product is working or the service is delivered. (Laamanen & Tinnilä, 2009)

Process goals should consider the customer and value creation to the customer as well as company's performance targets, like using resources effectively. Goals are easier to follow if the definitions are concrete and the goals are adjusted when necessary. (Martinsuo & Blomqvist 2010, 17) Process improvement goals can be, for example, to increase production efficiency, improve quality as well as improve the ability to manage problem situations. (Kollanus, S. 2014) All in all it aims to better customer satisfaction and competitiveness.

3.5 Controlled Change

By systematically controlling the change it is easier for people to commit themselves to the change. This means clarifying the roles, responsibilities and goals

as well as informing effectively about the changes. To relieve the fear of change it is good to explain why the changes were made, who is affected by the change and who are critical for the successful change, how the information is given, what kind of training is necessary and how the support of management is shown. (Laatujohtamisen tiimi 2009, 11)

3.5.1 Four Rooms of Change

One model of controlled change is Claes Janssen's Four rooms of change (1996). It defines how change affects an individual and the whole organization. The rooms describe the progress of the change as well as the emotional state of individual or organization. (Laatujohtamisen tiimi 2009, 11)

The first room is called *satisfaction* where the existing actions are maintained because habit has made people blind and people do not see any need to change their actions. The second room is called *denial* where no-one wants to make any changes because they think that the safest way is to stay the same. In this room there can be resistance, avoidance and frustration. The third room is *confusion* where people realize they need to give up the old actions but the new actions are still unclear. This makes people uncertain and might cause some inefficiency. People are asking why, how, what, where and when. The fourth and final room is *renewal* where people focus on few things that have been agreed. Thing are done together and there is motivation and trust. (Laatujohtamisen tiimi 2009, 11) Figure 7 shows how individuals and organizations will move from one room to another. After the renewal, they will always eventually go back to satisfaction.

Satisfaction →	**Denial** ↓
* Need for change is not seen * Habit makes blind * The current situation meets the aspirations	* "The safest way is to stay the same" * Resistance * Evasion * Frustration
Renewal ←	**Confusion**
* Work together towards the goals * Motivation * Responsibility * Trust * Energy	* Need to let go the past but new procedures are unclear * Uncertainty * Ineffectiveness

Figure 7. Four rooms of change. (Laatujohtamisen tiimi 2009, 11.)

It is crucial to manage all rooms of change to get people committed to the change. During *satisfaction* the existing model must be questioned and give reason why the existing model might not be the most efficient or easy way of operating. In the state of *denial* it is important to share information and show that change is not a bad thing. During *confusion* people should be guided to the right direction. In this phase it is important to show how to do things right and explain the reason for each change so that it is easier to understand why things are done as they are done. In *renewal* the goals are set and people are led to achieve the goals. (Laatujohtamisen tiimi 2009, 11.) Eventually people will move back to room of satisfaction and when it is time for new changes', a new process of change starts from the beginning.

4 PROCESS MODELLING

In this chapter the focus is on process modelling-what it means, why and how to do it.

4.1 Description

Process modeling is a visual way of illustrating either the current process or the target state and revealing its possible defects and areas of development. (Martinsuo & Blomqvist 2010, 3) Visual presentation can help to understand the process better and to see what the shortcomings are because the whole process can be seen at once.

By modeling the process it is easier to understand what the most critical activities for value creation are. Activities that do not add value are removed and possibly some activities are added if they are seen to add value. If modeling is done successfully, there are several benefits: The customer receives better service which might affect his purchase decisions in the future; employees understand their role in value creation and are better motivated and customer needs are understood resulting in better products and services. (Laamanen & Tinnilä 2009, 52-53)

Process modeling means identifying and describing value-adding actions and the information and material flows which are connected to those actions. Modeling starts by identifying clear start and end points for the whole process and by finding out what the inputs and outputs are. To help determine the limitations it is good to outline on a general level what the process interfaces, added value, subtasks and resources are. (Martinsuo & Blomqvist 2010, 9)

To help understand the process it is good to make a process description. Before making the description the purpose of the process must be defined. Also the entity must be outlined; who are the suppliers, what is the input, the process itself as well as to define the output and the customer. (Laatujohtamisen tiimi 2009, 8.)

4.2 Why to Model

The most important goal of modeling is to understand the entity of the process. Modeling makes operations more transparent and simple and at the same time it

helps to evaluate if the right things are done right. (Hartvaara 2008, 3) Process modeling is necessary so that resources can be focused on value creating activities instead of those that deplete the performance. (Martinsuo & Blomqvist 2010, 1)

4.3 How to Model

Modelling can be done for various purposes. It can describe, for example, process and workflow, duration of different tasks and where the responsibility changes from one person to another. (Hartvaara 2008, 3)

Process modeling can include the description of the entity formed by the processes or description of a single process focused on its value creating activities. To increase the performance process must be measured. It can mean radical restructuring (re-engineering) or continuous smaller improvements (continuous improvement). One part of process development and description is identifying the responsibilities and resources. (Martinsuo & Blomqvist 2010, 1)

Process modelling starts by gathering the basic information about the process. After that a process chart is drawn and explanations are written down. (Hartvaara 2008, 4) Despite of the importance of visual presentation, it is also necessary to explain the charts in words. Sometimes text is the best way to present something so not everything needs to be presented in visual form.

A process should be described in a consistent and simple way. By focusing on what is relevant it is possible to leave out those steps that are not critical to success. Process charts should be drawn from left to right, so they are easier to read and follow. It should be considered if the right things are done and if the right things are done right. (Martinsuo & Blomqvist 2010, 14) It should be also clearly indicated what kind of decisions are made. Persons' names should not be used in descriptions, instead roles are used to show who is needed at which state of the process. When doing the description, it needs to be made sure that all the necessary parties participate to increase the level of knowledge, ideas and perspective. This will also increase the level of commitment. (Martinsuo & Blomqvist 2010, 15)

The content and function of the process affects to some extent on which level and how the modeling should be done. If there is a lot of uncertainty in the process it is not reasonable to draw a model with too many details. On the other hand there are processes that require more detailed modeling, for example those that include critical information about security. For this reason it is useful to check at the beginning what is the content of the process and in what level the modeling should be done. (Martinsuo & Blomqvist 2010, 3-4)

Description is followed by actions. It needs to be made sure that the description is visual and illustrative. There can be several levels but the level of details should also be considered. It is possible, and sometimes even important, to add reference to work instructions. Description and instructions should be available for everyone who might need them. (Martinsuo & Blomqvist 2010, 15)

4.3.1 Current Process

When describing the current process it is possible to proceed from start to end following information and material flows as well as value adding actions as they are done in practice. (Martinsuo & Blomqvist 2010, 10) It is important to accept that some of the current actions are not executed in the best possible way and that the process description might become chaotic, ambiguous or difficult. Process modeling will help to find out the areas that need to be developed. For this reason it is important not to mix up the current and the target state, but to keep them separated so that areas of improvement are found. (Martinsuo & Blomqvist 2010, 13)

4.3.2 Target Process

For target state description it is justified to proceed from the end to the beginning. (Martinsuo & Blomqvist 2010, 10) This is because it is easier to ask “what should be done to fulfill the customer needs?”. At the same time it is reasonable to write down what knowledge, tools and systems are required in each task. It need to be made sure the process becomes simple and achievable. Those tasks, resources and

systems that do not add value should be removed from the target process. (Martinsuo & Blomqvist 2010, 13)

4.3.3 Logical Level

Even though the basic idea of modelling is simple there are several challenges in effective approaches. One of the challenges is choosing the right logical level. Many times the problem is too detailed for modelling. Choosing the right logical level for operational modeling is important. Logical level defines the focus area and level of detail. It is better to keep the model simple and not to add too many details. (Laamanen & Tinnilä 2009)

For some processes it is more critical to describe them with more details and allocate the needed resources. Sometimes very detailed flow charts are needed to execute the process. In detailed process description actions and connections between the actions as well as the roles and the responsibilities are separated. Sometimes also tools and information are described. In this kind of detailed process description there should be a clear difference between two different situations. In the first situation the process should always be executed in the exact same way so that the detailed description will support consistent information and uniform practices. In the second situation the process has uncertainties and its exact execution is unnecessary so the process description should not be too detailed and it might be enough just to list the work phases. (Martinsuo & Blomqvist 2010, 10)

4.4 Flowchart

As it is said, “one picture is worth a thousand words”. By drawing a process chart one can simply show the whole process at once. Flowchart is one way of describing the process. It is also known as logic or flow diagramming. A flowchart describes the process and relationships between the different tasks. It can be used to describe an existing process or propose new process models. (Harrington 1991) A flowchart describes data flow in a process and it helps in analyzing the data.

Flowchart is formed from simple symbols, lines, arrows and words. Each symbol has its own meaning and arrows describe the way of information flow. Text is used

to shortly describe each step. A flowchart illustrates how the different elements fit together. This makes also process improvement easier since it is quite easy to notice which elements are not as effective as they should. It also illustrates where the rules and policies are unclear and need to be refined. When the flowchart is done well it highlights the areas which are bad for quality and productivity and need to be improved. (Harrington 1991)

There are three different flows that can be used to describe a process. The following three flows are presented in Figure 8. The first one is sequential flow. It is straight forward and leads from one step to another, from start to finish. The second one, loop flow, means that between some steps the flow can go around as many times as needed before the task is finalized. The loop can be caused by missing information or other unfinished business. If-then-else flow is presented in the third picture. It is used in situations where different decisions can lead to different outcomes. The process flow differs depending on which alternative is chosen. (Mauch 2010)

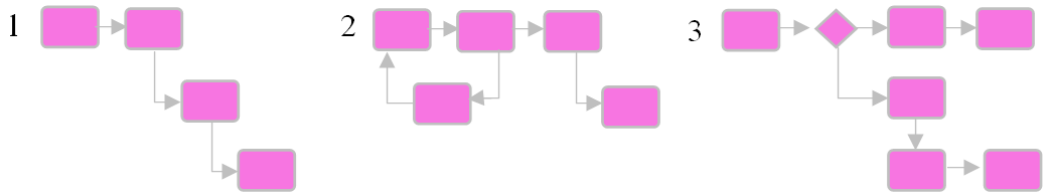

Figure 8. Three forms of flows.

It is not always easy to draw a flowchart. It must be decided that on which level the chart is drawn – on the organizational level, departmental process or some single work phase that will be described in the smallest detail. Flowcharting takes time and many times it is the best if people from several phases of the process could take part in making the flowchart. Unfortunately the existing documentation and instructions are seldom so sufficient, wide and accurate that a flowchart could be created only based on that material. There might be differences between the instructions and practice. (Harrington 1991)

To separate a process chart from a process map, it is also justified to explain that a process map describes the key processes and the relationships between them.

Process map is done with fewer details and it can include core and support processes as well as the customer's processes. It can reveal the company's vision. (Laamanen & Tinnilä 2009, 125) A process chart describes a single process in a more detailed manner.

4.4.1 Different Types of Flowcharts

For detailed process description there are several different ways to present the description. None of the description methods have been standardized and there are several variations. Some of the common methods are flow chart, task matrix and swimming track diagram. Especially in a flow chart and a swimming track diagram there are well-established markings and symbols. If the company already has its own symbols, it might be best to use those to avoid any confusion. It is common to write the content of the action inside the symbol to give more detailed information. (Martinsuo & Blomqvist 2010, 10)

5 CONTINUOUS IMPROVEMENT

Problems are opportunities to improve. They are everywhere just waiting for someone to find them. Continuous improvement means organized improvements of actions in different levels of organizations. Continuous improvement is built on four basics steps: planning, implementation, checking and corrective moves, if necessary. Continuous improvement highlights identifying the root cause, removing of unnecessary work and it does not except poorly functioning process. (Jatkuva Parantaminen ABB Oy:ssa 2005, 4)

A company should have defined goals and an action plan on how to improve and maintain processes. The goals can be for example on-time delivery, certain productivity level or lead time. Actions can be monitored and improved based on internal and external feedback. This kind of information can be received from employees, internal audits, suppliers or customers. (Jatkuva Parantaminen ABB Oy:ssa 2005, 4)

People are used to doing things as they hava always done before. When something changes, problems might occur. Problem solving is needed when improving processes, actions, products or services. It is important to go through the problems and ideas thoroughly so that it is not just the symptoms that are taken care of. It is essential to dig deeper and find and solve the root cause. (Jatkuva Parantaminen ABB Oy:ssa 2005, 8) To find out the root cause, quality tools like Brainstorming, 5*Why or Fishbone can be used. There are also many other quality tools available and the information is easily found from books and the Internet.

5.1 Measuring

Process measuring is an important part of process development. Small amounts of data can be analysed manually and it can give significant amount of information. However, for continuous follow-up and large amounts of data it is reasonable to use proper systems support. (COALA, 2014)

Good measure characterizes the true performance of the process and even predicts it. It also considers the needs of all the players, it is reliable and easy to understand.

It gives a clear picture of what to develop. When the process measure is made to work automatically, it will not consume the resources of the process. (Martinsuo & Blomqvist 2010, 16)

A measuring system's primary function is to support process guidance and continuous improvement. Measuring inputs and outputs can then help to find the causes of the problems. (Martinsuo & Blomqvist 2010, 15) However, an old saying "You get what you measure" is suitable in this context. For example, if measuring is focused on the quantity of the products, the ones who implement the process might direct their actions to promoting it to ensure the best possible result. Another example is that when the measuring focuses on resources and the minimizing of resources, people might easily find shortcuts and compromise those tasks that require a lot of work. (Martinsuo & Blomqvist 2010, 16) On the other hand, if the goal is to split the lead time or, for instance, keeping the schedule people can work to promote goals. This makes choosing the right measures extremely important. (Martinsuo & Blomqvist 2010, 17)

Process should be guided and managed so that the set goals are achieved. The less there are things to memorize, the easier it is to control the process. Usage of simple measuring and measuring the right things are the key points. The results of measuring can be used for continuous improvement or even in more radical changes. (Martinsuo & Blomqvist 2010, 15)

Inputs, outputs or the process itself can be measured. There are, however, some things to consider when deciding how and what to measure. Measuring outputs like customer satisfaction, production volume or income does not give real-time results because the measuring is always done afterwards. In uncertain environments it is common to focus on measuring inputs like resources, raw material or costs because it is easy to collect the data but, again, the data does not support process optimization during implementation. (Martinsuo & Blomqvist 2010, 15)

5.2 Benefits of Continuous Improvement

Figure 9 demonstrates how continuous improvement affects different factors. With continuous improvement it is possible to increase competitiveness. By increasing the quality of products and services the reliability increases whereas errors and deficiencies decrease. It is easier to deliver on time when quality is good and consistent. (Moisio & Ritola 2005, 4)

By improving quality customer satisfaction increases. It can be seen in that the number of complaints drops and customer loyalty increases. Quality of products and services is linked to quality managements and employee participation. They support each other and if one of the areas is ignored it will affect the outcome. (Moisio & Ritola 2005, 4)

Quality management and employee participation results in benefits within the company. These benefits are, for example, reduced costs, shorter lead times and smaller staff turnover. It will also result in higher staff satisfaction, increased productivity as well as in better occupational health and safety. As a result of continuous improvement competitiveness increases and the company can earn higher profit and gain bigger market share. (Moisio & Ritola 2005, 4) Benefits of continuous improvement are shown in Figure 9.

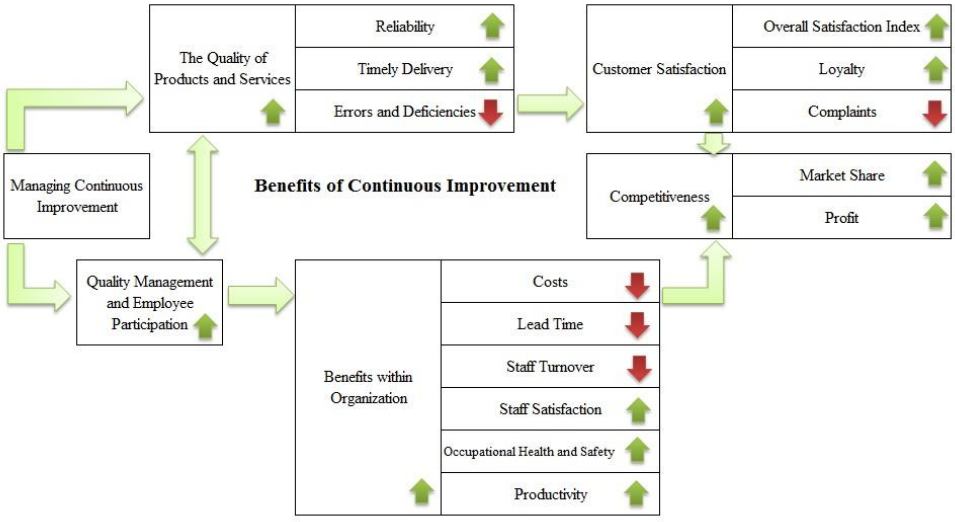

Figure 9. Benefits of continuous improvement by Moisio and Ritola (2005).

6 INTRODUCTION OF A CASE COMPANY

ABB is stock listed multinational company based in Zurich, Switzerland. It is divided into five divisions providing different power and automation technologies. ABB focuses on research and development. (ABB in Brief)

ABB operates in around one hundred countries. It is the largest transformer manufacturer in the world. This study is implemented at ABB Oy Transformers, located in Vaasa, Finland. The factory in Vaasa has specialized in special transformers, for example, sub-sea transformers. (ABB Products)

6.1 ABB Oy Transformers

A transformer is one of the key components in an electricity grid. It changes voltage to a suitable level. ABB Oy Transformers has a transformer factory in Vaasa Finland. The unit manufactures, for example, furnace and rectifier transformers, on-shore and off-shore transformers, reactors and even subsea transformers. ABB Oy Transformers is globally in charge of the product development of special transformers in ABB Group. ABB's transformers can be found around the world; e.g. power stations, substations, oilfields, railways, industrial plants, hydro- , wind- and solar electric power plants. (ABB in Brief)

6.1.1 ABB Oy Transformers After Sales

This study is focused on ABB Oy Transformer's after sales department. Their main responsibilities are commissioning engineering and warranty handling. After sales has no sales targets since its purpose is to maintain customer satisfaction by taking care of warranty cases. After sales has an important role - when after sales is done well it gives good image of ABB and customers experience good customer service. Good service might influence their decision of purchasing products again and they might even recommend ABB to others. Unfortunately, it also works the other way around so if the customer is not satisfied with the service, in the future he might start buying from a competitor and even spread bad word of mouth. This makes after sales services an essential part of the organization.

7 AFTER SALES: CURRENT STATE

The current state of ABB Oy Transformers after sales was examined by interviewing people and having meetings where existing processes were examined. The current state describes situation in 2013. The aim of these interviews was to find out how the current process works in different departments. The marketing manager, project management manager and forwarder where interviewed to find out how they see the current process. In addition to these, several meetings were held with the presence of project management manager, production planning manager, order handler and senior after sales engineer.

Statistical information was gathered from SAP from the time period of 26th of March 2010 to 25th of March 2013. The existing process charts were examined with the senior after sales engineer to find out how well the current process charts responds to the current situation.

7.1 Interviews

Three interviews can be found attached. These interviews aim to find out what is the current state of after sales and what are the problems in the existing processes. The marketing manager was asked about the importance of after sales and how it has succeeded so far. He was also asked what after sales does and whether there are any sales targets for after sales and what are their future goals. The final question was “Who makes the decision if the warranty is still valid?”. This specific question was asked as it had come up that there are some uncertainties with this area of a process. (Attachment 13)

The main findings were that after sales’ main responsibility is warranty handling among spare parts sales, repair and transformer modifications. When after sales is handled well it is more likely that the customer will purchase products again. If after sales is handled poorly it is possible that it will affect their future purchase decision negatively. The main goal of after sales is to keep the customer happy and for that reason they do not have any specific sales targets. According to the marketing manager each case is handled and especially big warranty cases are handled very

well. Negative feedback is mostly related to lead times and response times. The financial impact caused by transformer failure can be huge which means that there is always a hurry when there is a defect. The future goal is to improve lead times and to exploit other ABB factories and Transformer Remanufacturing & Engineering Services, TRES, units to even out the peaks. Spare parts sales is already outsources to Product Support but it still has certain challenges as they are not fully familiar with the products and they need access to databases and archives to find out the correct spare part. The final decision of warranty validity is made by the marketing manager as it might have some strategic impacts on future sales. (Attachment 13)

The project management manager is responsible for after sales. He was asked to explain what the current resources are and what kind of roles they have. It was discussed whether they had enough resources and what is their relationship with TRES. The findings will be explained later on. One of the findings was that after sales has very limited resources and that they feel that they do not get enough support from TRES. It was also discussed that it is not always easy to use work force from other units as they might not share the same values and working methods. By negotiating deals with TRES units it could be possible to shorten lead times and work loads. (Attachment 14)

As sending the parts to site is an essential part of the repair process it was logical to interview the export forwarder to find out how they see the process and what the challenges in existing processes are. The export forwarder issues export documentation and arranges transportation to site. The export forwarder also issues invoices. The main findings were that the biggest problem is lack of communication. The impulse can come in post-its, email or face to face in a hallway. Especially with the post-its it is difficult to make the delivery on time as most of the information can be missing and it might not even be clear from whom to ask. They are not sure when they should have a sales order and when the shipment can be sent without a sales order. When a package does not have a proper reference it is more likely to be forgotten in some corner and soon no-one remembers what it was. Positive feedback

was received about the current spare parts sales process. Also invoicing was quite clear. (Attachment 15)

7.2 Sales Statistics

Data for analyzing sales order rows was gathered from enterprise resource planning system SAP. The time period from which the data was collected was 26th of March 2010 to 25th of March 2013. The statistics include two sales order types: ZTSS and ZTWR. They do not include supervision and spare parts that were sold together with the transformer.

In March 2010 ABB Oy Transformers changed their ERP systems from BAAN to SAP, and this can be seen as significantly higher number of sales order rows in March, April and May 2010 as shown in Figure 10. The number of new sales order rows in 2010 was 322. Some of these rows were transferred from BAAN to SAP so the number is not comparable to other years. It is also not a whole calendar year.

In 2011 and 2012 the numbers are more comparable with each other. In 2011 185 new sales order rows were opened as the corresponding number in 2012 was 201. In 2013 there were 70 new sales order rows opened in the time period of 1st of January until 25th of March. The estimation for the year 2013 would then be around 280. A conservative estimation would be that new sales order rows are increasing in number.

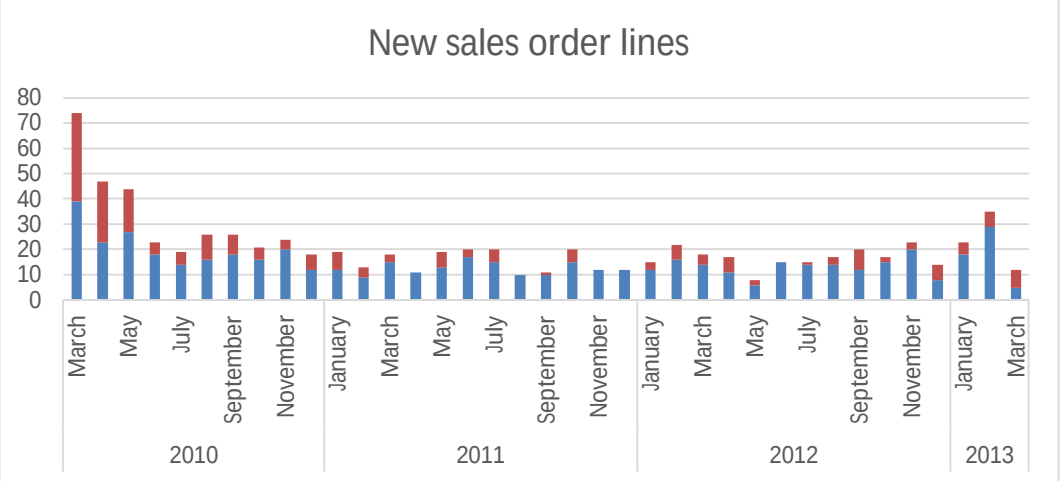

Figure 10. New sales order lines.

After sales has no sales targets since their main goal is the retention of customer satisfaction and giving a good image about ABB. With good after sales service they keep the existing customers satisfied and might even attract new ones.

7.2.1 Sales Order Types

There are two different sales types used in this context: ZTSS and ZTWR. ZTSS was used in 72 per cent of the sold rows and ZTWR in 28 per cent of the cases. ZTWR is used for warranty where the customer is not invoiced. ZTSS is used in cases like selling spare parts or supervision where the customer will be invoiced. Sales order type is selected before opening the sales order and cannot be changed later on. For this reason it is critical that the order handler is aware of which sales order type to use.

Being critical towards the sales order data from SAP is necessary. By manyally checking the sales orders it can be seen that some warranty sales orders were opened with wrong sales order type. This can result in inaccuracy in sales order statistics. An another problems is that ZTSS includes rows that are invoiced only after the actual costs are known so there are many rows with zero value even tought the real value can be thousandas of Euros.

7.2.2 Customers

One very important factor when opening a new sales order is to choose the right customer. Customer cannot be changed afterwards so it crucial to choose the correct one because otherwise a wrong customer will be invoiced.

ABB Oy Transformers has a long list of customers. A big share of those customers are internal customers, in other words other ABB units from around the world. There are also external customers, so called third-party customers. In most cases internal customers are only acting as an intermediary and the end customer is the third party. In this data there were 118 different customers from which 90 were internal customers.

By examining the sales order data it can easily be seen that there is one internal customer, Customer A, who represents 31 per cent of all the sales order rows. It was also seen that 38 customers, excluding customer A, were representing 52 per cent of the rows and they had more than four sales orders each. Customer A is operating in the same factory and has daily co-operation with the case company, which explains why they are playing so big role in this chart. Figure 11 illustrates how customer are divided.

Figure 11. Customers in relation to sales order rows.

It is important to understand that many of these rows are not invoiced since they are warranty. 25 per cent of this value is coming from customer A which was already highlighted in the chart above. The second largest is a single external customer, customer B, with 13 per cent share. Others have mainly less than 3 per cent share. The chart below illustrates how revenue is divided between the years. It should be noted that the rows are not fully comparable.

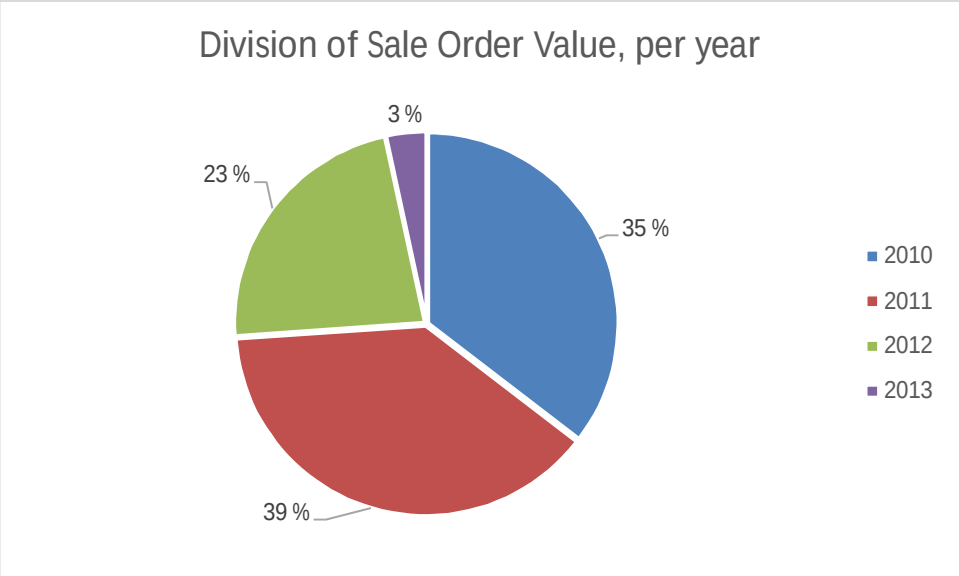

Figure 12. Value of sales order rows and how they are divided between years

7.2.3 Sales Order Material

ABB After Sales Services has many different products and services. Even though their core business is warranty handling and commissioning engineering they also sell, for instance, spare parts, repairs and transformer upgrades. Before opening the sales order it is important to understand what kind of work phases are needed so that correct material can be chosen.

There are several possibilities depending on what kind of service or product is needed. The easiest way is to use a so called dummy code. A dummy code can be used for several different purpose but the connecting factor is always that the sales order row that was opened with a dummy code can not be designed, manufactured or delivered. In practice this means that a dummy code is mainly used for services like testing, supervision, warranty work or freight. Sometimes spare parts are sold by using dummy codes, which means that a manual inventory reduction is needed to make sure that goods are taken off from inventory. Most used dummy codes are presented in Figure 13.

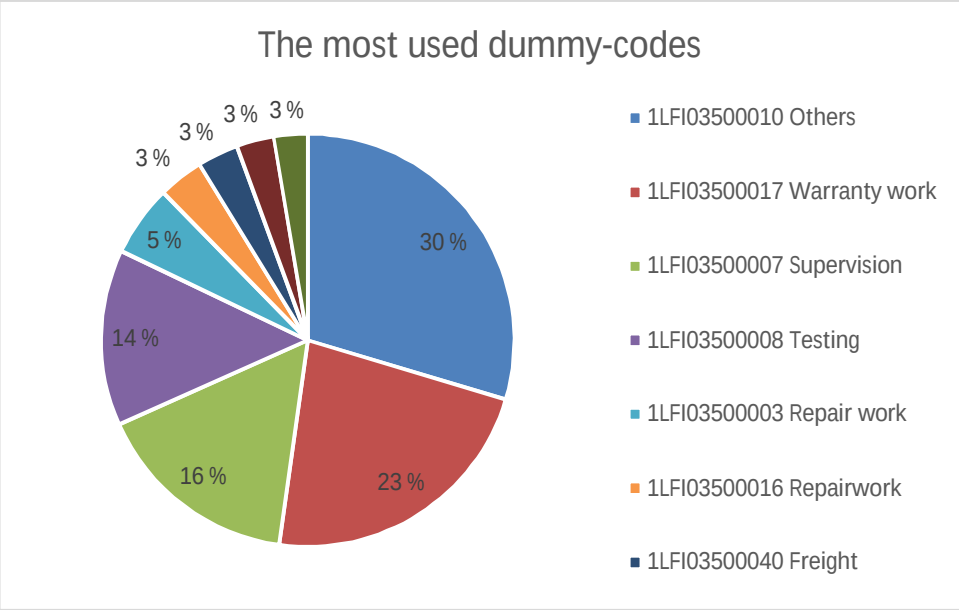

Figure 13. The most used dummy-codes.

Another way to create new material is to use a POL-number which is generated in Mechanical Design Sytems (MDS). A POL-number is used when there is a need for design, purchase or manufacturing. The thrid way is to use an existing material code which is the best way in a sence that the change in inventory is made when the delivery is marked as ready. Unfortunately this can only be used when there are finished products, like oil or some spare parts, that do not need manufacturing and the material code already exists in SAP.

7.3 Tools and Resources

Tools and resources are shortly presented below. This topic was discussed with the project management manager who gave an overview of current resources and their roles. It was found out that after sales resources are quite limited.

7.3.1 Resources

Figure 14 demonstrates the resources of the after sales department. It shows the hierarchy but the focus will be on those who are a part of the daily operations. After sales is a part of project management, which makes the project management manager to hold a managerial position. After sales engineers and mechanics are not

in superior-subordinate position to one another. This chart was drawn together with the project management manager.

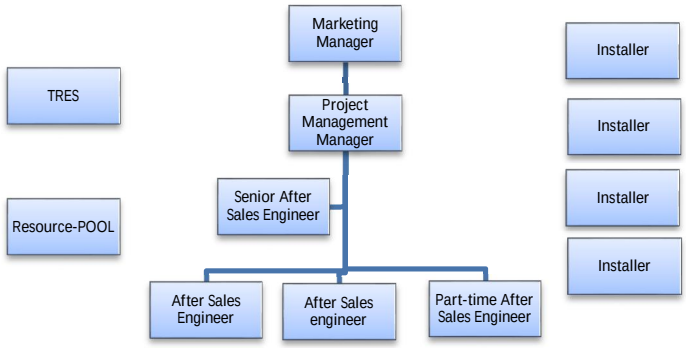

Figure 14. After sales resources in 2013.

A senior after sales engineer's task is to coordinate after sales actions and to answer inquiries. In bigger quality cases he keeps the strings in order. He is the owner of a travel mechanic-POOL. One of his responsibilities is to ensure that mechanics have all the necessary training and qualifications. Vacations and training sessions are marked into a travel mechanic-POOL calendar. (Attachment 14)

There are two fulltime and one part-time after sales engineer. One of them has fifteen years of experience and he is mainly working in the United Arab Emirates where the quality standards are very high. The quality cases in United Arab Emirates and in Saudi-Arabia are challenging not only because the requirements are high but also because the environment brings its own challenges. Since he has the required competence and is familiar with the sites and local customs it is reasonable that he focuses on that area. According to the project management manager, he has been there approximately 90 per cent of time in the last four to six years. (Attachment 14)

Another fulltime engineer is travelling where-ever needed to take care of the bigger quality cases. He is also responsible for maintaining a measuring skill matrix. Part-

time after sales engineer works approximately 16 to 20 hours per week. His main area of responsibility is CCRPs and inquiries from the United Kingdom. (Attachment 14)

There are four mechanics. Their main responsibility is to take care of commissioning engineering around the world. Even though commissioning is mainly supervising the erection of a transformer, they will also take part in the assembly. After the assembly is completed, they will check the transformer so that everything works as it should. When they are not travelling and installing new transformers, they work in the factory where they can maintain their competence. (Attachment 14)

In addition to these there is Transformer Re-Engineering Services, TRES and a resource-pool where resources can be loaned globally when necessary. TRES is active in more than one hundred countries, so it has global presence. They are specialized in services, testing and repairs done at site but they also offer engineering solutions, repair works and spare parts. They are working alongside after sales but after sales sees that they do not get enough support from TRES. Sometimes installation and supervision are bought from the country of destination to even out the peaks. (Attachment 14)

During spring 2013 after sales was overloaded. One of the after sales engineers was working with warranty cases in the United Arab Emirates and also another engineer was there most of the time. In addition, there was one longer sick-leave. For this reason, many times there was only a part-time after sales engineer at the office. In a small team like this even one person’s absence has a significant impact on workload. According to the marketing manager mechanics are travelling around approximately 75 per cent of the time and when they are not travelling they are working at the factory to maintain their skills.

7.3.2 Computer Programs

There are several software and computer programs that can be utilized during the process. The most used software and programs are SAP, MDS, Excel and email as

well as different databases like StartPoint and SharePoint. Some of the programs communicate with each other. For example SAP and MDS can transfer data from one program to another.

A warranty handling database is a very important element of a transparent way of working. A warranty handling database, a so called WaHa base, is still under construction and there have been experiments if some existing database, for example, from ABB Medium Voltage Products or ABB Motors and Generators could be exploited. The goal is to make communication easier and more transparent. Emails are sent to one address and all the engineers can read them and reply. If someone is absent someone else can handle the case since all the information is available in the WaHa-base instead of one's personal email. (ABB Oy Transformers, 2013)

7.3.3 Measuring Competence Matrix

During the first quarter in 2013 site measuring competence matrix was established to improve competence to perform site tests for transformers and to maintain information on the completed trainings and each person's know-how. (ABB Oy Transformers, 2013)

The purpose of the competence matrix is to list all the mechanics and all the different measurement skills they might have. This matrix shows the competence of each mechanic, which measures they are competent to measure and this way it is easier to choose a suitable mechanic for each case. Every installation is unique and some transformers require more site testing than others. The measuring competence matrix can also be used for identifying what kind of training is needed.

7.3.4 Customer Complaint Resolutions Process, CCRP

Customer Complaint Resolution Process, CCRP is a web tool designed to help follow up and work together on customer complaints. Every ABB employee is obligated to submit customer complaints and dissatisfaction to CCRP. The information about customer dissatisfaction can be received in several forms – by emails, phone calls or even indirectly at coffee table. CCRP can be done at any

ABB unit regardless of which ABB unit will then solve the problem. Issues related to Net Promoter Score are seen as especially critical and are treated as such. Other very critical complaints include issues where people's safety is compromised, highly sensitive situations where customer relationship is in jeopardy or issues that are complicated by crossing business unit/country involvement within ABB. (ABB Inside)

Complaints are an opportunity to create satisfaction, build relationships and improve products and services. IT resources are used to find and support solutions that help handling customer complaints. CCRP is used to record to problems, action plans and activities. Using CCRP also makes the customer dissatisfaction handling process more defined and clear to employees. (Introduction to CCRP)(Group Instructions)

7.4 Current Processes

After Sales has two existing process charts - one for warranty and repair process done at the factory and the other one is for site work. Both charts had been updated in February 2010. Both processes are explained below and are attached to this thesis. These processes were examined with a senior after sales engineer to find out how well the current process charts respond to actual workflow.

7.4.1 Warranty and Repair Done at Factory

When a customer informs about a problem. CCRP is opened by the person who receives the complaint-this can be done at whichever ABB sales organization or unit. When the information about the problems reaches after sales, they will ask the sales department or the project manager to find out if the warranty is still valid. After sales makes a technical clarification about the defect in cooperation with the customer. Defect report 1 is formed. The process chart can be seen in Figure 15.

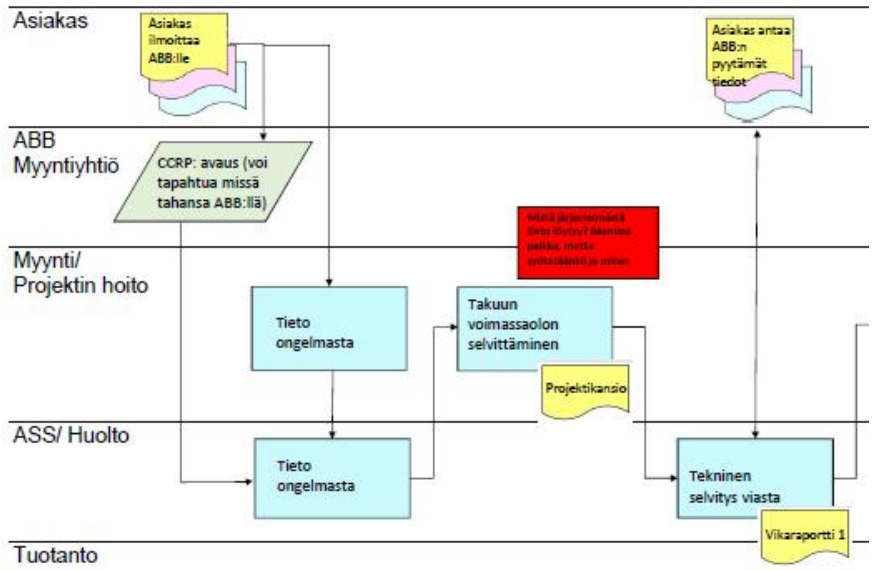

Figure 15. Warranty and repair done at factory.

The sales department or the project management identifies the customer, processes the defect report and decides about warranty work. If the warranty is not valid, after sales forms an offer about advanced troubleshooting. The customer processes the offer and orders troubleshooting. At this point sales is opened in SAP and to warranty database. CCRP is closed. This is also done if the warranty is valid. The process chart can be seen in Figure 16.

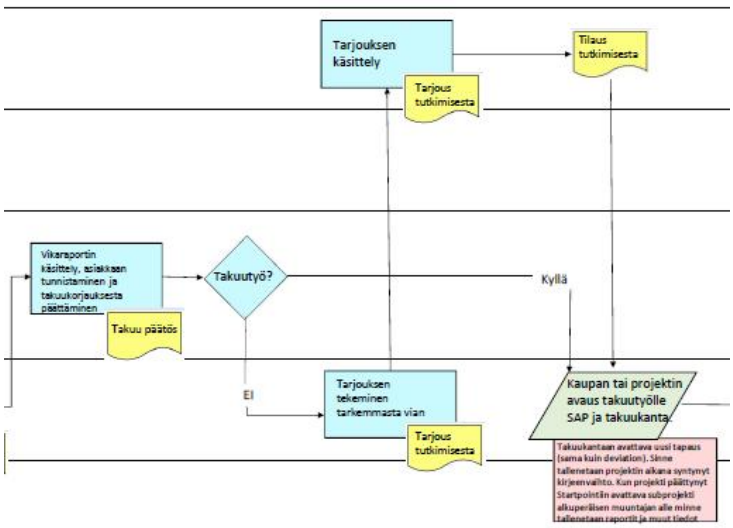

Figure 16. Warranty and repair done at factory.

The next step is to do advanced troubleshooting and as a result defect report 2 and a repair plan are is formed. Again, it will be identified whether the warranty is still valid or not based on the findings during troubleshoot. If the defect is not considered to be under warranty after sales offers repair work. A customer can send an order after processing the offer. The data is updated to SAP. If warranty is valid, electrical design will transfer Bill of Material, BOM, into SAP and the critical materials are ordered, if necessary. The process chart can be seen in Figure 17.

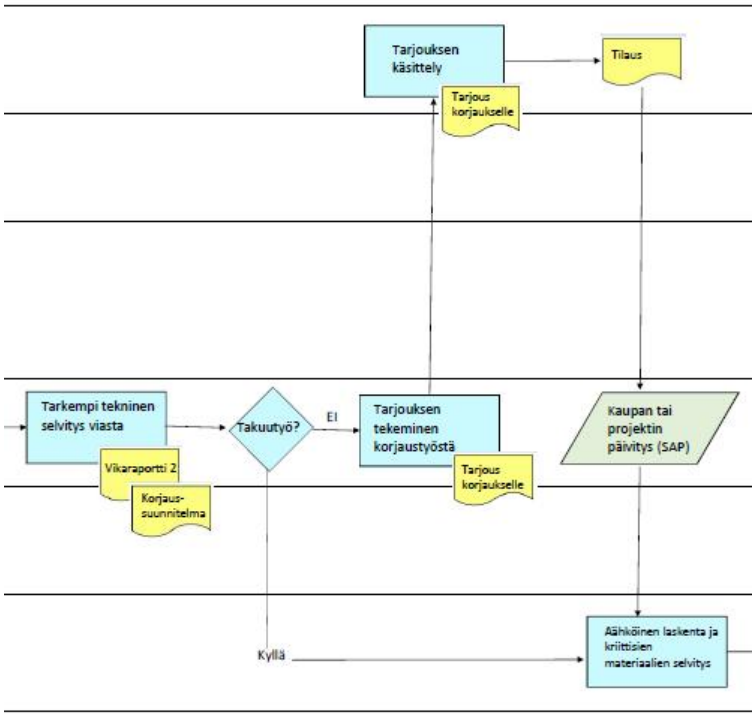

Figure 17. Warranty and repair done at factory.

After sales will name the project manager and a Gate 1 –meeting is held. The necessary procedures are done according to order-delivery process. The warranty case is finished and information is downloaded to StartPoint. The process chart can be seen in Figure 18.

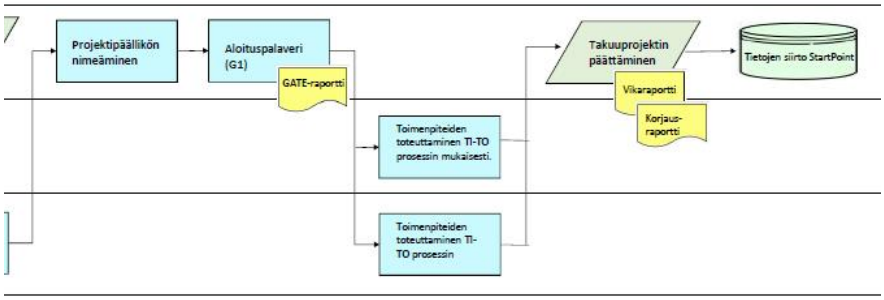

Figure 18. Warranty and repair done at factory.

7.4.2 Process for Site Work

Phase 1: Reclamation. The customer informs about a problem. CCRP is opened by the person who receives the complaint-this can be done at whichever ABB sales organization or unit. When the information about the problems reaches after sales, they will ask the sales department or project manager to find out if the warranty is still valid. After sales makes a technical clarification about the defect in cooperation with the customer. Defect report 1 is formed. The sales department or the project management identifies the customer, process the defect report and decides about warranty work. At this point the process is identical with the warranty and repair process at the factory. The process chart can be seen in Figure 19.

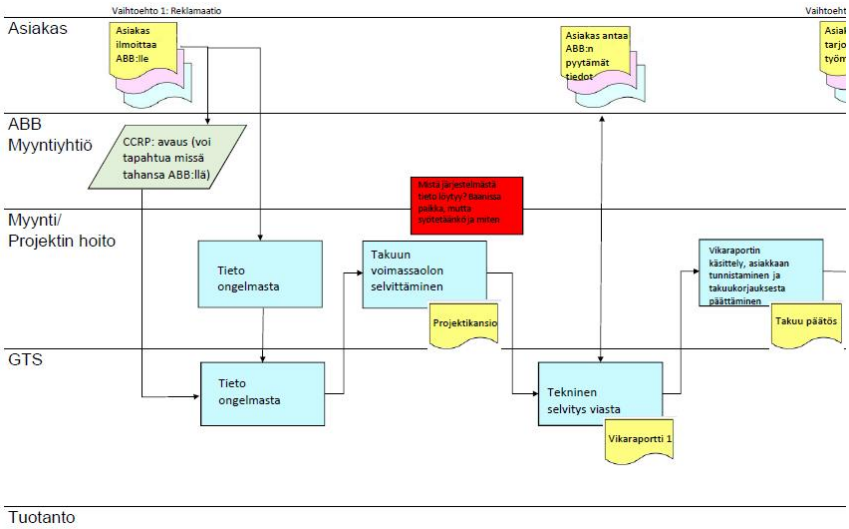

Figure 19. Site work process.

Phase 2: Tender request. The customer sends a tender request to after sales. After sales makes an offer. The customer processes the offer and places an order. If the repair is done under warranty the tender request phase is disregarded. Order handling opens a sales order to SAP. CCRP is closed and the project is inserted to warranty database. After sales sends the acknowledgement of order to the customer and names the project manager. The process chart can be seen in Figure 20.

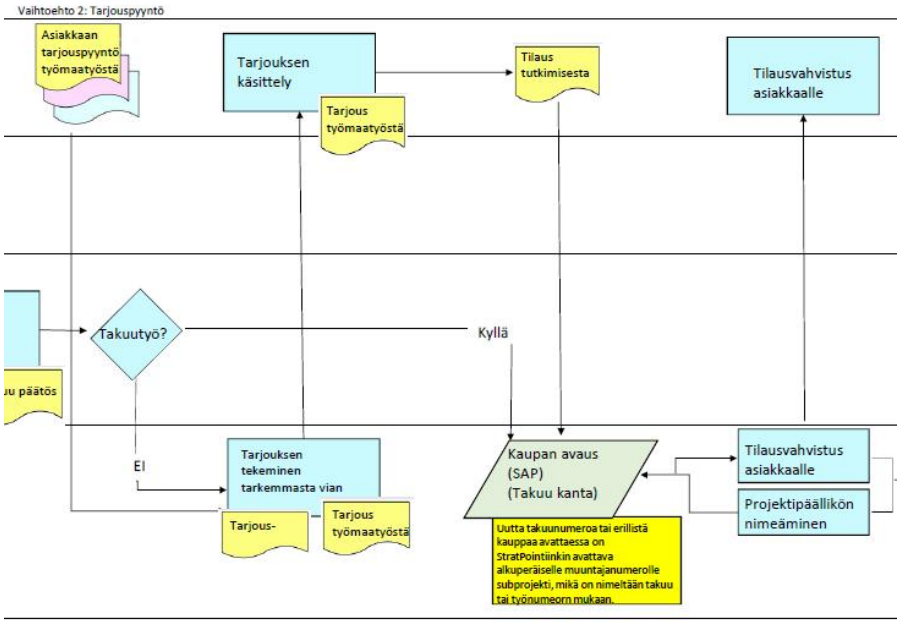

Figure 20. Site work process.

Necessary information is looked up from different systems. Schedules and resources are planned and agreed. After sales has its own resources and if needed resource-POOL can be used. The customer receives a confirmation of schedules and resources. Mechanics do the agreed work at site and work is approved by the customer. If the transformer has any deviations it will be documented. The project is completed and the project manager gives an impulse to forwarding for invoicing if necessary. Information and documents are uploaded to StartPoint.

7.5 Problems in Existing Processes in Different Departments

Multiple problems were identified in the existing processes. To start with, the definition of after sales is unclear. At the moment they are involved in many things

that they themselves think is not on their responsibility - such as spare parts, selling services to customer A and transformer upgrades, not to mention about all the email inquiries which are a big part of their workload. Because of unclear definition it is sometimes hard to know who is responsible for what and for that reason some things might stay unfinished.

Another issue is lack of transparency. Many times it is seen easier to skip a work phase to get things done faster. Unfortunately it is not quite understood how it affects other departments. For example, if order handling is ignored it means that the project does not exist in SAP or any other system. This means it will not appear in any work queues so it won't be designed or purchased. If someone picks up a spare part from warehouse it just disappears and SAP's inventory is not updated. The export forwarder cannot issue a packing list or proforma invoice in SAP. Also the costs cannot be linked to this particular project if it is not on SAP. Now that the SAP's inventory shows more parts than the reality is, the inventory must be crashed which of course distorts financial reports. It can also cause a situation where spare parts are not found from the warehouse even though according to SAP there should be some left. All together this results in multiple workload since everything must be agreed in person with each department and since there are no official documents, some procedures become complicated than usual and more manual work is required. Other disadvantage is that sometimes packages are forgotten and delivery is delayed.

The two existing process charts do not cover all after sales processes and the charts are quite complicated. Some processes require more detailed description where as some could benefit from lighter process. When aprocess would be as simple as possible it would be easier to follow and removing the unnecessary steps would diminish unnecessary work and make the processes faster.

Roles and responsibilities are not defined which results in behavior where people say "This is not my responsibility" or "This does not add value to my work". It would be very important to define roles and responsibilities for each employee so that everyone knows who is responsible for what. Also, if additional information is needed during the process it would be easier to contact the right person.

In this case pressure to change comes from inside and outside the company. The process is seen unsteady which causes problems in many department internally. As mentioned in the marketing managers interview the goal is to shorten lead times and response time to increase customer satisfaction and this cannot be done without changes being made.

7.5.1 After Sales

After sales has a big workload and most of the cases are urgent. Everything needs to happen fast and customer satisfaction is extremely important. Unclear processes cause unnecessary delays which, of course, affects on customer experience. Undefined roles cause resistance as it is not clear who should be doing what. When things are done manually it causes a lot of extra work because everything must be monitored.

7.5.2 Order Handling

Order handling is a fast step if the necessary information is available. Skipping steps makes order handling more complicated. Information must be collected from multiple sources and waiting for answers can sometimes take days.

In order to open a project in SAP, at least the following information is required: sales order type, customer, sales person, project manager, delivery date and terms, price and terms of payment, items and description where all the spare parts are specified. All the details can be changed afterwards except for sales order type and customer information. If the order handler receives an impulse that contains only a little information about the sale, she or he must go around asking people for more specific information which is time consuming.

Unlike the normal transformer projects after sales does not use Gate1-form. This would speed up the order handling process since all the information could be found on one paper. Instead they receive emails where they need to seek for the information and then ask for additional information. With G1-meeting the facts would already be considered and all the information would be written on the G1-form.

One problem has been that no one would like to be responsible for spare parts and services sold customer A. Many times customer A sends purchase order directly to order handling and then order acknowledgement is sent straight back to customer A. There is no project manager or sales person who would verify the price or time of delivery which has caused problems. This is, of course, a problem if the goods are sold too cheaply or when a too short delivery time is promised, the on-time delivery falls to lower level. Unfortunately it has also been noticed that many times customer A did not even send the purchase order so they got the parts and services for free.

7.5.3 Electrical and Mechanical Design

If the order has been opened to SAP work will appear in designers work queues automatically. To help the designer's work, the work order should contain enough information. Unfortunately many times there is no project opened in SAP and designers are only told to open a structure in MDS but there is no data in SAP. Another problem is that the designer does not have enough information about the case and work does not proceed. Again lack of information makes the process work more slowly than it should.

7.5.4 Purchasing

To purchase spare parts and other materials the sales order must be in SAP to be visible on work queue and also that there is project where the costs can be allocated to. Due to this it may be that the purchaser does not purchase the needed material on time since he did not know about it.

7.5.5 Production

Problems in production are many times related to information flow. If the sales order is not in SAP it does not appear in any work queues because they are not added to production planning software Concerto. In this case the information is only flowing manually and there is a greater risk that the information flow is interrupted. It is not defined who gives the impulse so it might be that the information stops at some point. Most of the times these are urgent matters that should be taken care of

as fast as possible. Sometimes it has been a problem that the information that production is ready does not reach the dispatcher and forwarder automatically which can cause a delay in shipping.

7.5.6 Dispatch and Forwarding

The dispatch department or the forwarder receives an impulse from after sales. The impulse includes a list of items to be sent and usually they should be sent in a hurry. If shipment cannot be found from the systems it is harder to collect correct material.

If the project is not in SAP the forwarder needs to issue the shipping documents in Excel, which takes a lot of time. It is also difficult to find out who is the consignee and all the other information needed for the shipping documents. It crucial to know what will be delivered so that the invoice and the packing list are consistent with the package. If the Customs opens the package and the goods do not match the documents it is certain that delivery will be delayed. Additional to the amounts and the descriptions of the goods the forwarder also needs to know the CN-number, the country of origin and the value of the goods. Without material numbers it is impossible to be sure.

A manually issued proforma invoice and packing list also include a risk that some old information is accidentally forgotten on the form, which can then cause problems with the Customs. Information for a manual packing list and a proforma invoice needs to be collected from different sources which can cause delay in delivery. For bigger shipments it would be good to contact the forwarder as early as possible so that there is enough time to issue shipping documents and arrange transportation.

There is also not a defined way where to put the packages which are ready for delivery and also how to inform the dimensions and weight to the forwarder in order to finalize the shipping documents and to arrange appropriate transportation. The forwarder needs to target freight costs to a project so for this reason it would also be important to have this information in the system.

7.5.7 Conclusions about the Problems

As mentioned earlier, the biggest issues are related to information flow. When there is a clear process to follow the flow is steady and things are done on time. In this case things are done in many different ways which requires continuous monitoring to make sure that things are done. Information must be gathered from many places and if afterwards there is a need to check what was done there is no trace in SAP or in Concerto. Also, it would be good to have information on paper so that everything can be archived if there occurs any problems or questions in the future.

For simple things like selling spare parts to customer A the process is too heavy. Because of that shortcuts are taken and the outcome may be incorrect. The price can be wrong, delivery time is not realistic and it is unclear when the sales order can be invoiced and marked as delivered.

9 AFTER SALES: TARGET STATE

By going through the current processes it was clear that changes were needed for processes to be steadier and more transparent. One major objective was to increase information flow and communication. Tools and resources are not changed significantly, instead they are utilized better.

In the target state roles and responsibilities should be defined more clearly. However, roles and responsibilities are excluded from this study because it needs to include discussions with the relevant employees and managers. After this empirical part of thesis was written the after sales department was significantly changed and roles and responsibilities were redefined at some level. Also, in the near future the structure will be changed again as customer A will become part of ABB Oy Transformers.

In this development process the steps of process development (Moisio & Ritola 2005) were followed. The first step was to identify the process and set up limitations. After that the process was modelled to make it possible to see the process as whole. New processes were presented and after that they were adapted to the daily operations. Process improvement is continuous and if changes are needed process charts should be updated accordingly.

Each process was modelled to show the process in a visual format. This way it is easier to see the most important value creation activities as well as help to understand the process better. New processes were drawn in a same manner as the existing process charts. It was good to use the existing symbols and layout to avoid confusion. In most of the processes the process starts when a customer informs about the problem and ends after the problem has been solved. These charts were designed together with the project management manager, the production planning manager, the order handler and the senior after sales engineer.

9.1 Gate1-Meeting

Gate 1 –meeting is a startup meeting that an after sales engineer convenes. A G1 -meeting is held if the project needs production or design. During the G1-meeting a

G1-form (Attachment 2) is filled and all the details are agreed to together with the after sales engineer, the production planner, the designer, the purchaser and the project manager. The project is scheduled and all the necessary resources are planned and agreed.

A G1-form includes information that is needed in order handling and production planning. The essential information is presented on one sheet. This will speed up order handling process because there is no need to walk around the office searching for information or waiting for email responses. A G1-form can be filled even if a G1-meeting is not held.

The G1-form is divided into two main sections: mandatory and voluntary. The mandatory information includes, for example, customer, project name, price, terms of delivery, description and list of spare parts. Voluntary information can include, for instance, special terms of payment or other remarks. The form was made using Adobe LiveCycle Designer. It is in a PDF-form and it can be filled and saved. The form is sent to order handling by email.

One important reason for having G1-meetings is to increase transparency. A G1-form is given to order handling where necessary data is gathered in one place. Earlier a lot of data was missing and the order handler was forced ask additional questions which, of course, takes more time. Also it has happened that one project has been opened twice as information flow has not been fluent. When a gate meeting is held the information is more reliable as the project is seen from many angles – the designer can tell when the design is ready, the purchaser can tell how long does it take to receive the materials and the production planner can tell when there is an empty slot in production. The meeting lasts for fifteen to thirty minutes so it is not a very long time. It is easier to agree on all the details when the necessary people are present. It is not necessary to hold G1-meeting when sending a few spare parts by courier but it is always useful to use the G1-form when opening a sales order in order to have all the necessary information clearly presented.

9.2 Delivery Request

A delivery request –form was an existing form that was updated and changed into a pdf-form at Attachment 1. The delivery request form is used for sending parts to site. It is simple to fill in but it gives valuable information to the export forwarder. By filling this form, the following information is given to forwarding: Who is sending the package, what the package includes and to what project is it related to. To be able to send the package it is also mandatory to have a delivery address and a contact person. The sender should also define the delivery term as it will affect transportation costs and risks. This form is also sent to the dispatch department where the material will be collected and packed. The dispatch department will deliver the dimensions and weight to forwarding and after that the forwarder can ship the goods. Delivery request is archived with shipping documents.

9.3 Inventory Reduction

Inventory reduction is very simple form (Attachment 3). If stock material is picked-up from the warehouse and it is not reported it can eventually lead to a situation where SAP shows that there is material in the warehouse but there is not any. To avoid this problem material should be reported to the purchaser who will issue a manual inventory reduction in SAP. The following information is required: Handled by, CCRP-number (if applicable), Project number, SAP material, description and amount for material.

9.4 New Processes

Most of the processes start when the customer informs ABB about a problem. If ABB sales organization receives the information, they will open the Customer Complaint Resolution Process, later called CCRP. After that ABB Oy after sales receives the information in form of a CCRP. The customer can also contact ABB Oy Transformer sales or project management directly. They will also open CCRP and use email to inform after sales. If the customer is directly in contact with after sales after sales will open the CCRP. To inform ABB the customer can use for example email or a phone call.

When the information about the problem reaches after sales they will be in touch with the customer and make technical report of faults. Communication is mainly based on emails. After having a clearer view of the problem it will be considered whether the repair is under warranty or not. If it is seen as warranty case, a sales person at ABB Oy Transformer, or the marketing manager, will find out if that warranty is still valid for that specific transformer. They will also handle the fault report, identify the customer and decide about warranty repair. At this point there is still a change to tell the customer that the defects are not covered by warranty or that the warranty has expired. In this case after sales informs the customer and gives contact information of the nearest Transformer Re-Engineering Services, TRES. Customer contacts TRES for quotations.

9.4.1 Warranty repair at factory

Warranty repair at factory is designed in situations where a transformer cannot be repaired at site. This is a relatively rare situation and the process is quite complex. Figure 21 demonstrates an overview this process followed by a more detailed description. The process chart can be found in Attachment 4 and process overview in Figure 21.

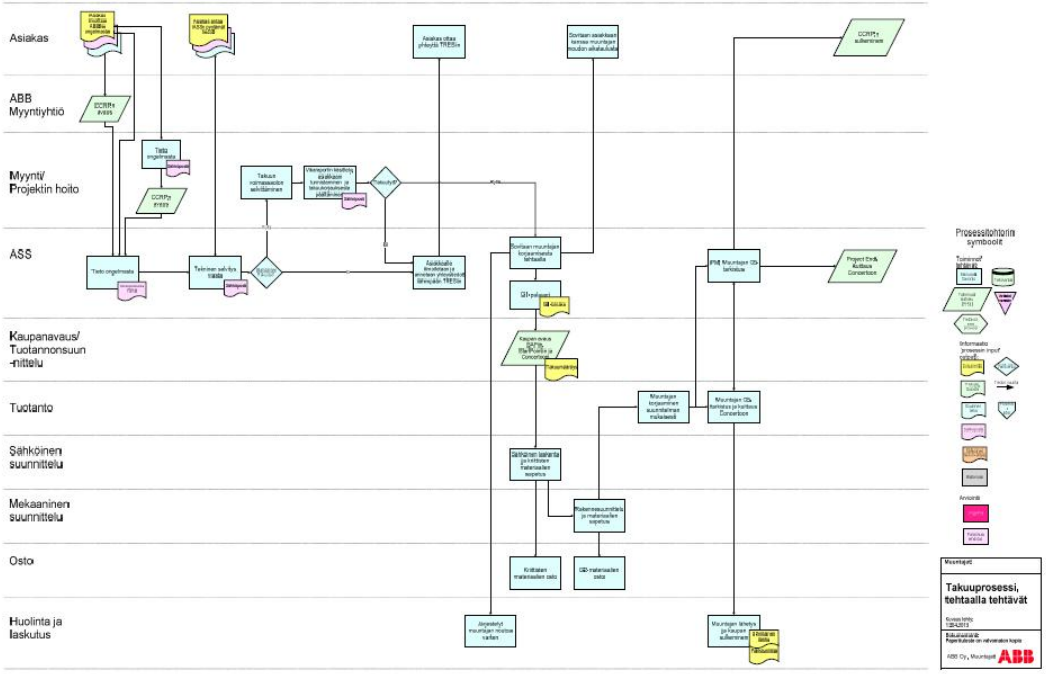

Figure 21. Overview of warranty repair at factory.

After information about the problem is received and examined the decision about warranty repair is made. In case the repair is not under warranty after sales will inform the customer and advices them to contact TRES. The warranty case starts with a Gate 1 meeting arranged by the after sales engineer. In this meeting there will be people from after sales, production planning, purchase and design. In bigger cases also the project manager is invited. As a result of this meeting a G1-form (Attachment 2) is filled and a timetable planned. Information is sent to order handling where the data will be inserted to SAP-system and open StartPoint page for documents. Output of this action is warranty order. The production planner will insert the data into Concerto based on the information from the warranty order and the G1-meeting. After the G1-meeting the after sales engineer will be in contact with the export forwarder and agree on the transportation of the transformer to Vaasa.

From Concerto the warranty order will go to an electrical design work queue. The electrical designer will transfer BOM into SAP and the purchaser can buy critical material. From electrical designer the warranty order goes to the mechanical designer who will transfer the BOM into SAP and the purchaser can buy the Gate2 –material. The process chart can be seen in Figure 22.

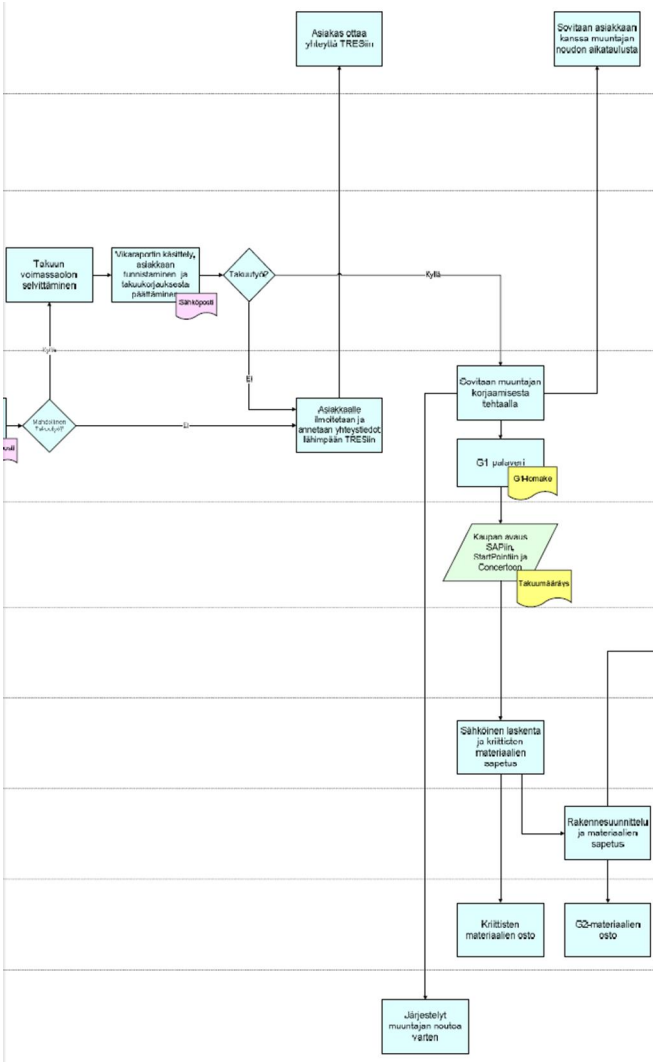

Figure 22. Warranty repair at factory.

After the designers are ready and material arrives the transformer is repaired in the factory as planned. When the transformer is ready a Gate5 –checkup is done and G5 is marked as finished in Concerto. The forwarder will issue shipping documents and arrange transportation back to the site. After everything is finalized the forwarder can issue a zero invoice to close the sales order. After sales marks the whole warranty order as finished in Concert and closes the CCRP. The process chart can be found in Figure 23.

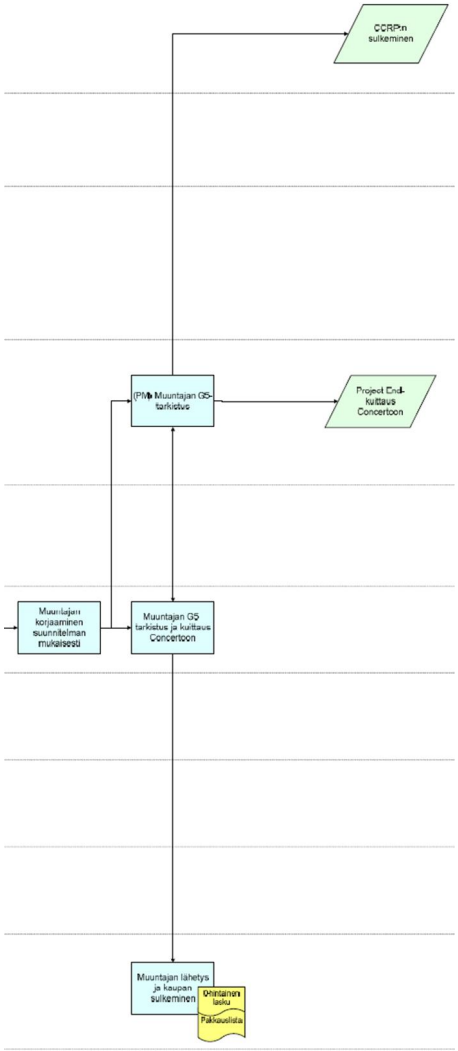

Figure 23. Warranty repair at factory.

9.4.2 Sending warranty parts to site

It is relatively common that small parts need to be sent to the site. This process can be divided into two different processes depending on if the material can be found from stock or if it needs to be ordered. In both cases it is possible that only parts are sent or a mechanic is sent to the site. The mechanic can either take the parts with him and they can be sent separately. Below in Figures 24 and 25 are shown the overview of both processes. These processes can be found from Attachment 5 and 6 and the process overviews in Figures 24 and 25.

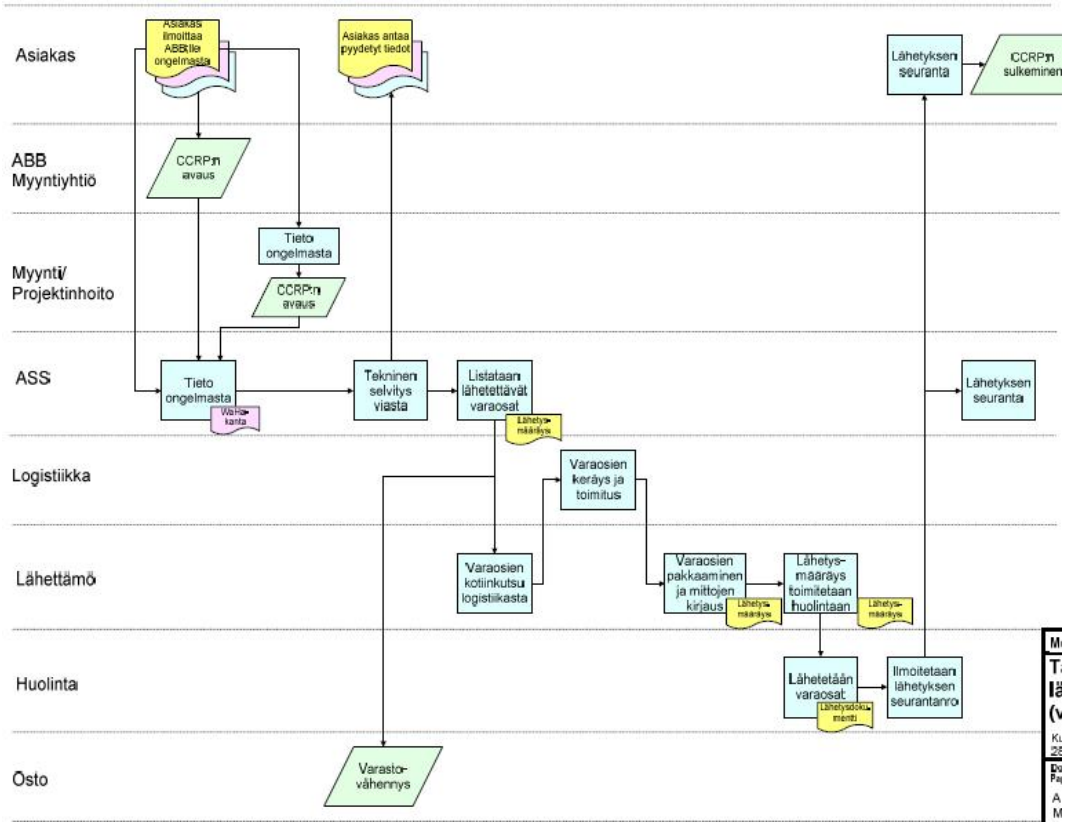

Figure 24. Overview of sending parts to site: Stock material.

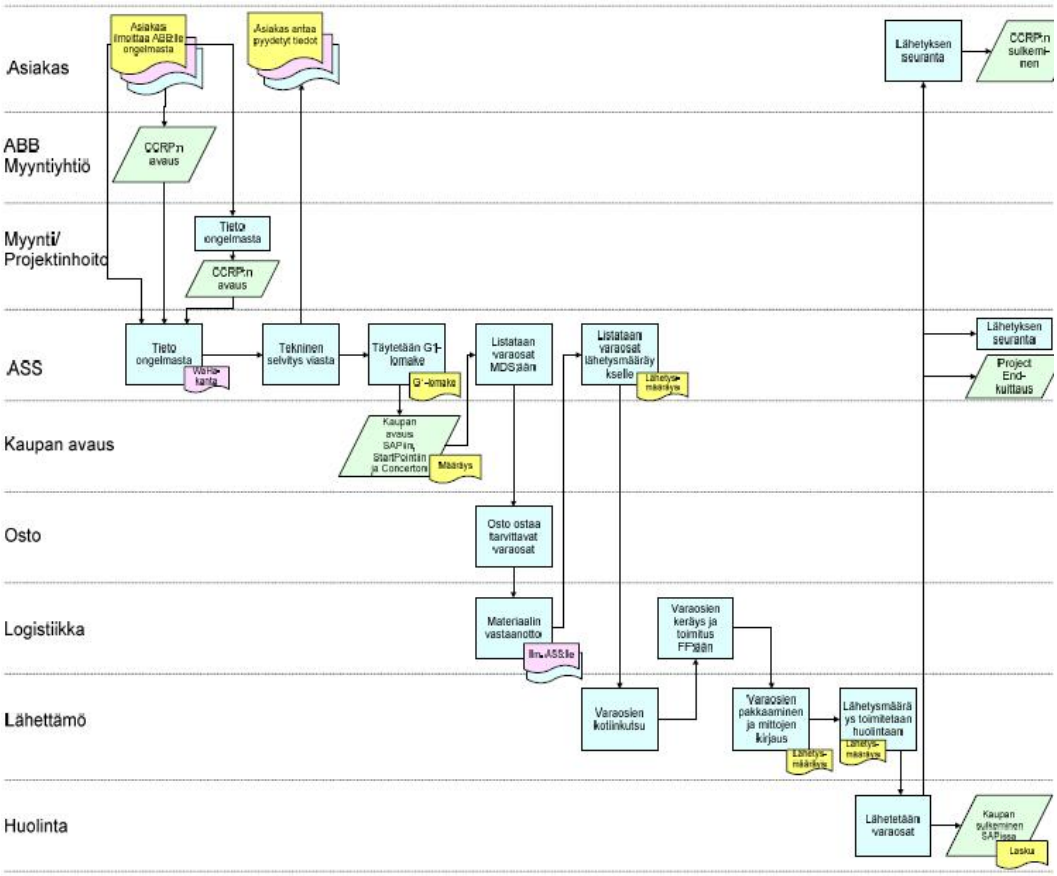

Figure 25. Overview of sending parts to site: Ordered material.

After the decision about warranty is made the after sales engineer will create a list of material and picks up the material from a warehouse or recall them to dispatch. This process chart can be found from Attachment 5. Parts are released against inventory reduction form. Logistics will then make the necessary procedures in SAP to make sure that inventory is up to date. In this kind of warranty case spare parts are small and relatively cheap; the mechanic can carry them in his suitcase or they can be send by courier. A travel mechanic will repair the transformer as planned at site and write a repair report. CCRP is closed after the transformer is fixed. A small warranty process at site can include spare parts and/or use of a travel mechanic. The process is demonstrated in Figure 26.

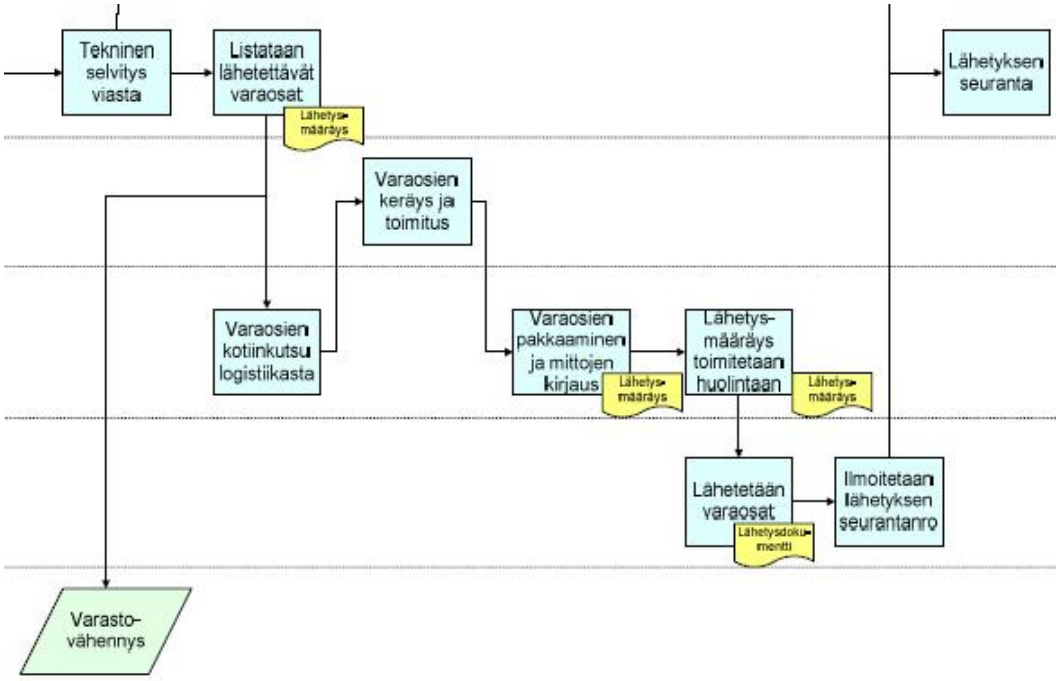

Figure 26. Sending parts to site: Stock material.

In case the part cannot be found from the warehouse it must be ordered separately, as shown on Attachment 6. After sales will fill in the G1-form and order handling will open sales to SAP. The designer will list all necessary items to MDS and the purchaser will order the material. After the goods have been received after sales will fill in a delivery request and send it to dispatch. Parts are picked and packed and finally dimensions are marked on a delivery request which is given to the forwarder. The forwarder issues shipping documents and sends the package to the site. A shipment tracker is sent to after sales and the customer. After sales marks the project end finished and the customer will close the CCRP. If needed a mechanic can be sent to the site to install the part. The process is shown in Figure 27.

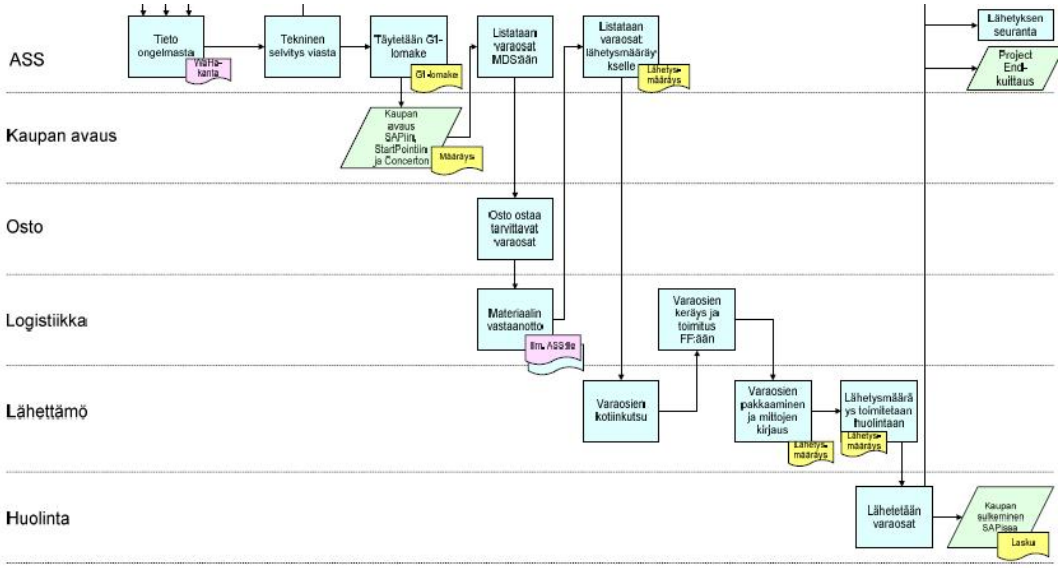

Figure 27. Sending parts to site: Ordered material.

9.4.3 Warranty Repair at Site

Warranty repair at site (Attachment 7) is significantly more complex than the small warranty process where parts are sent to thesite and a mechanic is sent to the site only if needed. If a transformer is broken it is always preferred to repair it at site, if possible. In Figure 28 the overview of the process chart is presented.

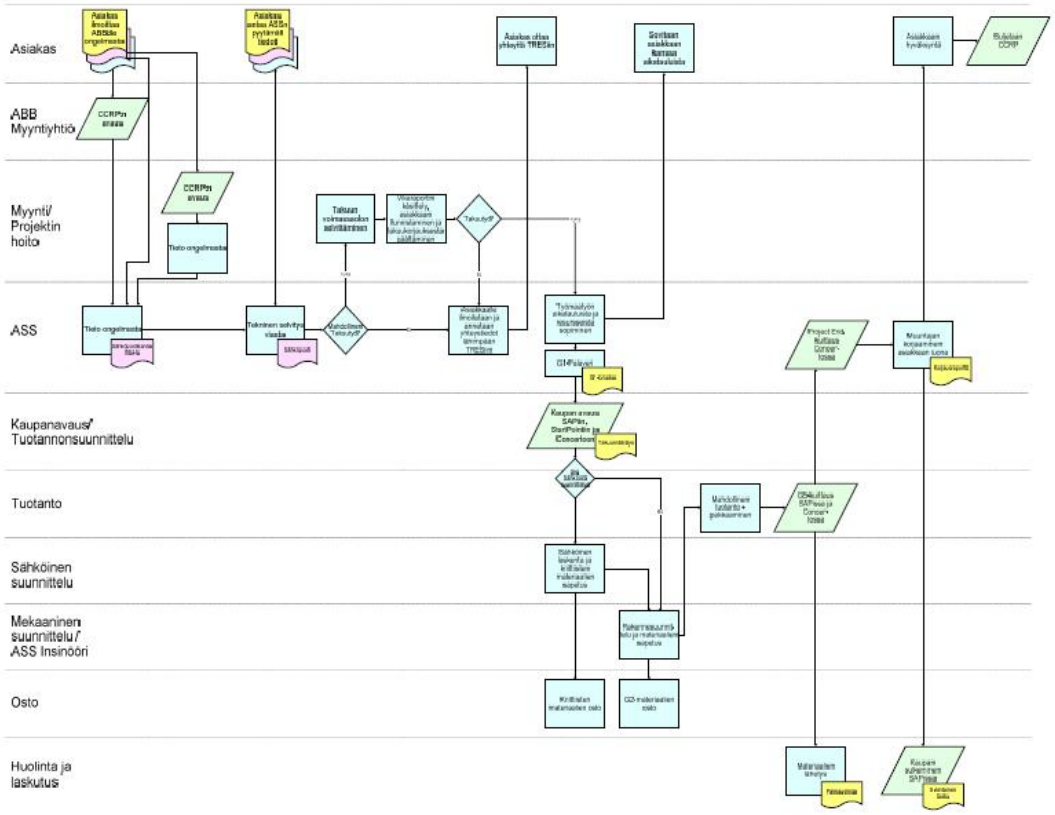

Figure 28. Overview of warranty repair at site.

Again, after it has been decided that the repairing is done under warranty after sales discusses schedules and resources with the customer. After sales invites a Gate1 – meeting and G1-form is filled. Order handling opens a warranty case to SAP. As a result a warranty order is printed out and uploaded to StartPoint. Before the project is opened in Concerto it must be clear what kind of a template to use, for example, does it include electrical design? This will affect if the project goes to work thr queue of electrical design or only that of mechanical design. The purchaser will buy the necessary materials after the BOM is transferred to SAP. Production makes the necessary procedures and materials are packed. Gate5 is marked ready in SAP and Concerto. After Sales marks the warranty project finished in Concerto and CCRP is closed. The forwarder will sent the material to the site and a travel mechanic will travel to the site when the material arrives. The transformer is then repaired at site as planned and after the customer has approver the repair the forwarder is asked to finalize the sale in SAP.

9.4.4 Commissioning Engineering

The customer can order commissioning at the same time as when purchasing the transformer or afterwards (Attachment 8). The purchase order is sent to ABB sales organization or ABB Oy Transformers sales or project management. From sales or project management the information is sent to order handling. The sales order is opened in SAP and the acknowledgement of order is uploaded under the original transformer page in StartPoint. After sales makes the preliminary booking of the resources and discusses the final schedule with the customer. After the schedule is clear after sales makes the final reservation of resources and creates a commissioning document.

Commissioning is done at site and a commissioning report is created and uploaded to StartPoint. The customer approves the transformer and the report. After the approval after sales reports the real costs to order handling and the value of the commissioning is changed. The order handler will give an impulse to forwarding. The forwarder will invoice the customer and close the sales order in SAP. Commissioning process is shown in Figure 29.

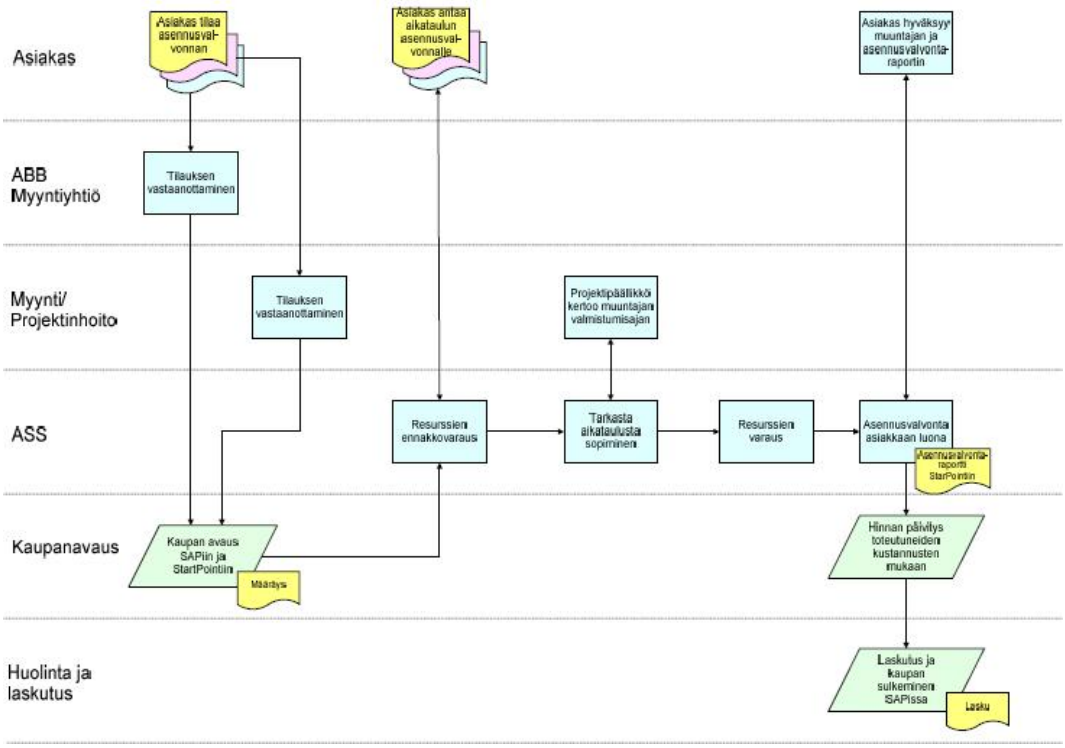

Figure 29. Overview of commissioning.

9.4.5 Processes Concerning Customer A

Customer A is an internal customer that operates in the same building with ABB Oy Transformers. They order regularly and they cover 33 per cent of the sold rows. This is the reason why customer A has simplified processes.

9.4.5.1 Vacuum and Testing

As shown in Attachment 9 and in figure 30 below customer A sends the purchase orders directly to order handling. A sales order is opened in SAP and the price is checked from the price list. An acknowledgment of order is sent to Customer A. Customer A agrees with production when the vacuuming and/or testing can be done. The purchase order is attached to the active part and delivered to forwarding after the work is done. Work hours are pointed to overhead costs barcode. After the forwarder is informed that the work is done a final invoice will be issued. Figure 30 demonstrates the vacuum and testing process.

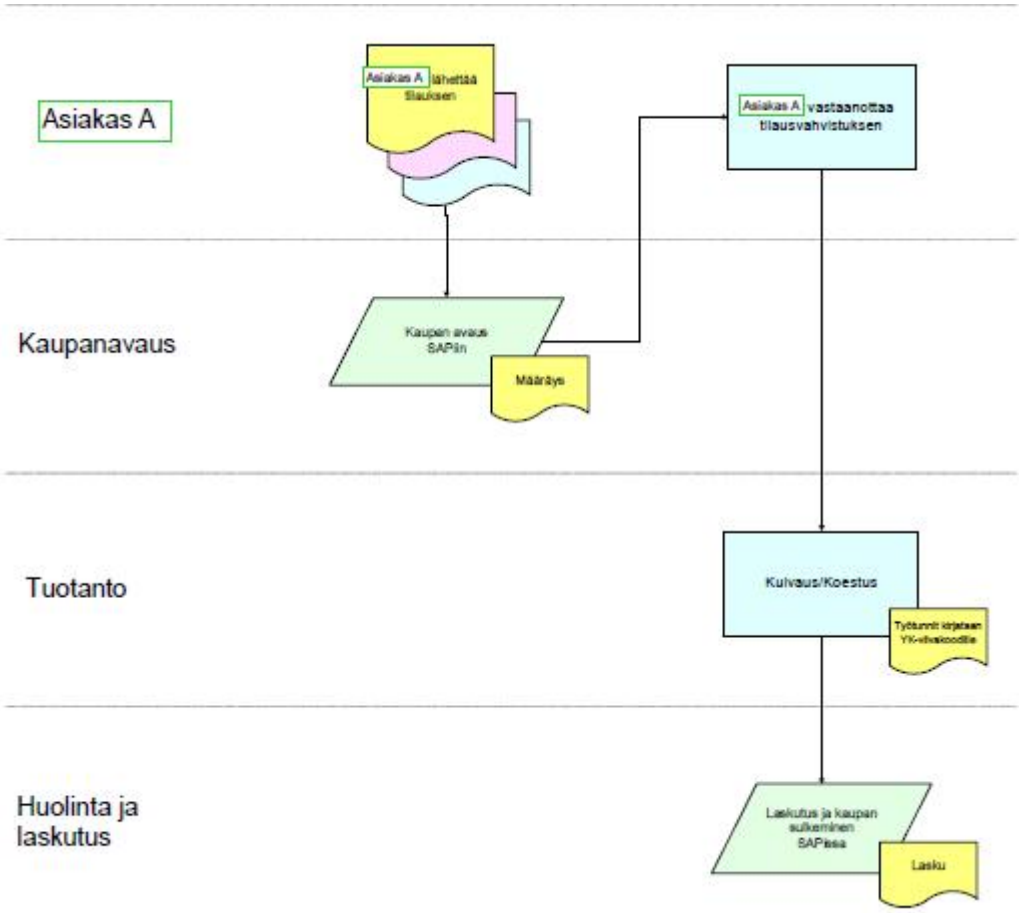

Figure 30. Vacuum and testing for Customer A.

9.4.5.2 Windings

Customer A sends the tender request straight to the electrical designer as shown in Attachment 10. The electrical designer calculates straight labor and material costs and sends the calculation to after sales. After sales finds out the schedule and resources and makes and offer to customer A. After customer A has received the offer they make an order and after sales invites a G1-meeting. The G1-form is sent to order handling where a sale is opened in SAP and StartPoint as well as Concerto. Order handling sends the acknowledgement of order to Customer A.

The electrical designer transfers BOM into SAP and the purchaser can buy the critical material. From the electrical designer the sales order goes to the mechanical designer who then transfers the BOM into SAP and the purchaser can buy the Gate2 –material. Production manufactures the windings and marks G5 ready in Concerto.

Thee forwarder issues the final invoice and marks the goods as delivered. After sales marks project end as completed. The process overview is shown in Figure 31.

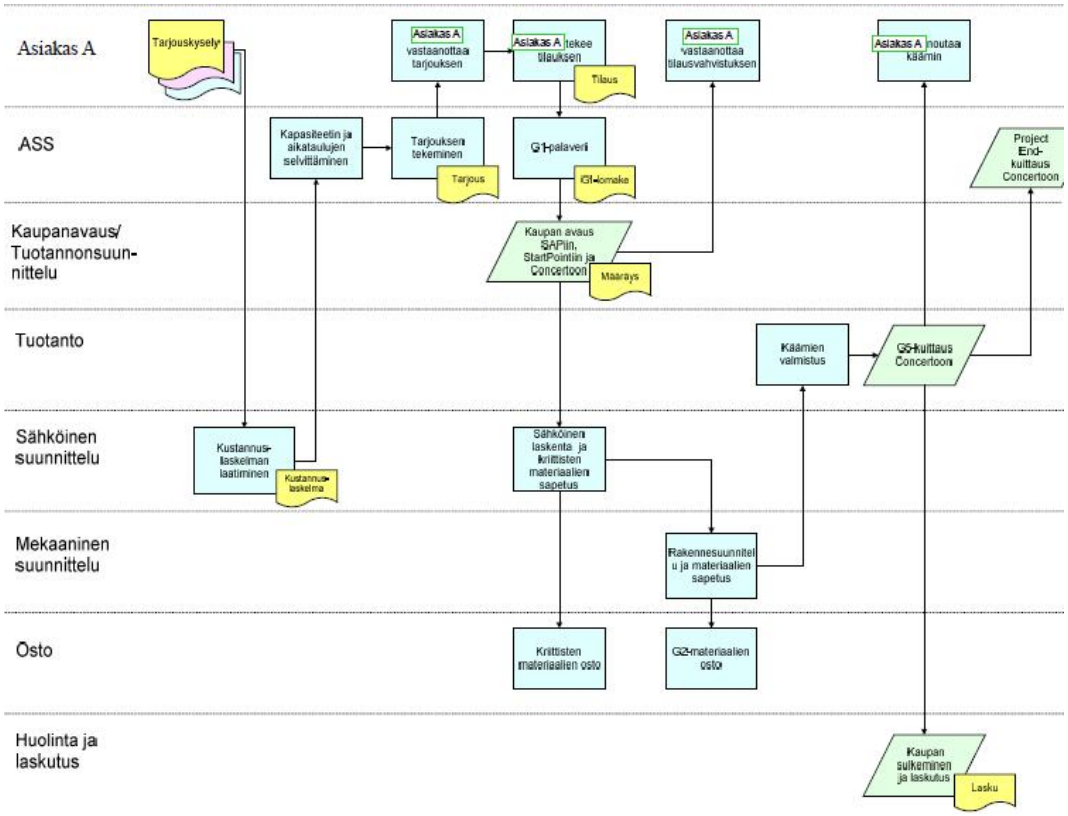

Figure 31. Overview of winding manufacturing for Customer A.

9.4.5.3 Rent of Work Force

Customer A can rent work force to factory works. Work hours are allocated to certain barcode. The hours are invoiced every six months and new orders are opened on 1st of January and 1st of June. Order Handling will change the price in SAP according to contract and actual work hours. Forwarding will invoice customer A after getting the impulse from order handling.

9.4.5.4 Nytro 10XN Oil from Shared Tank

This process is valid only for 10 XN oil that is used from a shared tank. Other oils are handled with separate purchase orders.

Customer A will mark the amount of used oil in a notebook and get the signature from transformers assembly manager. Customer A sends the purchase order to order handling at the end of each month. Order Handling opens the sale in SAP and sends acknowledgement of order to customer A. Order Handling also sends an impulse to forwarding so that they can issue an invoice.

9.4.5.5 Stock Material

This process is valid for stock material and invalid for material that is ordered for each project separately. Customer A is allowed to fetch stock material only from a person working in logistics. Logistics maintains a list of material handed over to customer A. At the end of each month the list is delivered to order handling. A sales order is opened to SAP and an impulse is sent to forwarding. The forwarder will issue an invoice.

9.4.5.6 Others

Other purchase orders than mentioned above are sent to after sales where the price and project manager are determined. If necessary also a Gate1-meeting is held. After sales informs order handling to open a sales order. An acknowledgement of order is sent to customer A. The project manager gives an invoicing impulse to the forwarder. The forwarder issues an invoice.

10 DIFFERENCES BETWEEN CURRENT AND TARGET STATE

In the current state there where two process charts; one for warranty and repair done at factory and another for site work. In addition to these after sales was involved in sending parts to site, arranging commissioning and selling goods and services to Customer A. The existing process charts were complicated and did not cover all the tasks they handled. It was seen that some processes, especially those concerning Customer A, could be handled through a simplified process. It was decided that more charts should be drawn to cover the most common tasks. Warranty repair at factory and warranty repair at site were altered but the main structure was kept the same.

One big change was that the charts were made more accurate by increasing the departments shown on the chart. In the current state the repair at factory was divided into six departments; Customer, ABB sales organization, Sales & Project Management, After Sales & Service, Production and Electronic and Mechanical Engineering. In the target state this was made more accurate and three players were added to show the project flow in a more detailed manner. In the target state the following players were used: Customer, ABB sales organization, Sales & Project Management, After Sales, Order handling & Production Planning, Production, Electrical Design, Mechanical Design, Purchase and Forwarding & Invoicing. Site work had originally five departments; Customer, ABB sales organization, Sales & Project management, GTS and Production. In the target state site work had same ten departments as repair at factory.

Another big change was, of course, that in addition to the existing charts five new charts were created to cover the most common tasks that after sales has. Sending warranty parts to site was divided into two charts; one for stock material and another for material that is project specific and needs to be ordered. Commissioning was also drawn as a separate chart as it includes quite different tasks compared to the other processes. The two process charts concerning Customer A were drawn and four other processes were presented in writing.

For repair at factory and site work the biggest changes were that a Gate1-meeting was added to the process. This was considered to help to collect all the data and to support order handing by presenting all the necessary information on one paper sheet, a G1-form. As more players were added it became more accurate and in the target state it is possible to see when the forwarder should start arranging transportation or what is the trigger to purchase G2-material. This should improve information flow as it is easier to understand what kind of things should be considered during the process and who is affected by what.

It is import to understand that these process charts are not described in full detail. After sales processes are very complex and need to be considered individually by following the main lines shown in the chart. Each case is different and might have its own special features that need to be considered during the process. To ease the work load processes were simplified as much as possible but at the same time they were focused on improved information flow, which was seen as one of the biggest problems.

Additionally, three forms were created to standardize information flow. The G1-form is used to collect data which is needed in order handling. The G1-form is already been used for transformer projects but now the form was modified to meet the needs of the after sales processes. A delivery request was also an existing form. It was used in Excel format and it was used occasionally. A delivery request form was updated to meet the needs of forwarding and it was also changed to pdf-format. The inventory reduction form was built to improve inventory accuracy. This form should be used whenever stock material is picked up from warehouse to make sure that SAP stays up to date.

11 VALIDITY AND RELIABILITY

The results of this study were received through qualitative research. Data was gathered from interviews and meetings as well as by examining existing process charts. Also personal experience was utilized during this research.

A qualitative research method was chosen to find out the problems in the existing processes. People from different departments and roles were interviewed to find out how the process works from different perspectives. In addition to interviews data was collected through meetings and conversations in the case company. Validity of this research could have been increased by having more interviews and by asking more detailed questions. This research was case specific and probably it is not directly applicable to other cases.

During this research it was found out that similar problems exist in different departments. It is possible that personal interests as well as resistance to change could have affected each person's input for the study. Personal experience from two departments could also have affected how the results were presented.

12 OPPORTUNITIES AND IDEAS FOR THE FUTURE

Many changes were made during this project. However, it is very important to carry out with continuous improvements in the future. Some of the processes work better than the others and it is important to improve processes that do not work as they should. New ideas should be considered to find out best practices.

Here are some the ideas for the future that might be useful to consider. First of all, it should be considered how to exploit TRES better. What is the added value they could give if they were used more widely around the world? As they have local presence they could be at site very fast and they are familiar with local customs which might help when working with different cultures. This kind of co-operation could also improve customer experience.

The second thing is to delegate the questions and inquiries. If after sales gets a lot of questions from the customers which are not directly on their area of expertise would it be possible to forward emails to those persons who are the experts in that field? This way the workload would be somewhat smaller and personnel would have time to focus on their core business. If the question is pointed to right person it is possible to have a faster reply as well and without middlemen the data would be more accurate.

For some parts the delivery time is very long, even months. Big items, like radiators, are usually transported by sea, which can prolong the delivery time even by four to six weeks. If new radiators are needed as fast as possible it should be considered if the needed parts could be send directly from the subcontractor to the site to shorten the lead time. Also smaller parts could be sent from the subcontractor directly to the customer by courier to save some time.

Some observations on the new processes are made and there are some steps that could be done differently to improve the process flow. Unfortunately there are still parts of processes that are bypassed. The delivery request form is working quite well as long as people are using it. It could be improved with small corrections like

adding a box for the country of origin and by adding instructions directly on the pdf form so that everyone would know how to insert correct information.

For the future it would be useful to have customer feedback and exploit it. Collecting information on transformer problems might help to understand what the most common problems are and to find out the root causes. After finding out the root causes it would be possible to make changes in the manufacturing process to avoid such problems in the future.

13 CONCLUSIONS

Improving the existing processes and creating new ones is a large entity that should be carefully planned to make it possible to achieve the best results. This requires true commitment and thinking outside the box in order to find out thebest solutions. It is very important to have different point of views to make sure that the new process meets the requirements of the whole chain. By involving people throughout the chain the resistance towards the change can be reduced and also the ideas of improvements can be included in the new process.

New process charts were issued in 2013. One objective of the improved processes was to make the processes more transparent and also to make them easier to follow. The increasing trend in new sale order rows can indicate two things. Either the rows have actually increased or the change in the process is the reason why more sales order rows are opened even though the actual amount is quite the same. When new processes were being built people were encouraged to open new sales order rows even for smaller cases to make the process more transparent.

From my own experience the G1-form and the Delivery Request-form were the best adopted practices. Most of the employees are filling in the forms when they need to open a sales order or when something needs to be sent. It has made the process more transparent and faster when all the information is on one sheet. In order handling it is much faster to open a sales order when all the information is available. Things are done right when there is no room for guessing. The delivery request form was already in use but it was updated and the form was built on a pdf format instead of an excel sheet. However, now that I have seen the process also from forwarder's point of view I have noticed that the delivery request is not always used. For those times the data is either brought personally on paper or the information is found on emails. This is something that still needs to be marketed so that personnel would be more committed to using it. The delivery request are archived with shipping documents so if there is any ambiguity later on it can be checked from the delivery request.

There are still some problems what comes to delivery requests. Some employees are using the old Excel version that they have downloaded to their own computer. The template is a little different so some information can be missing when using the old template. Another problem is the reliability of information, for example proforma value. Has it been checked from SAP or is it “the best guess” and is the total value or value for one item? Also, one thing that could have been added to the form is country of origin. Country of origin is needed when goods are sent outside of the European Union. At the moment the origin is requested from the purchasers case by case. However, I think the problem would be similar with the proforma value - is the data reliable.

The biggest observation during this development process was that it is crucial to have expertise from all the departments that are involved when improving and developing processes. A small change in one department can have a huge impact on another department. By having only limited amount of understanding of each department’s requirements it is very hard to make decisions that would match everyone’s needs. In large entities it is almost impossible to have clear understanding on every single work phase and the impact they have on each other. This emphasises the need for having employees from each department share their knowledge and participate in the development process.

Another observation was how important it is to get people to commit themselves to change. If people do not understand the reasons behind the change or do not see any benefits in new process it is highly unlikely that any of the changes are adopted in the daily operations. The one leading the change must be able to convince people that the new process is better than the previous one and that they will benefit from the change.

It was quite easy to recognize especially the first two rooms of change. Satisfaction was the first stage where people didn’t really want to change anything as they had gotten used to doing things their own way. After the development process proceeded resistance started. At that point it became really important to explain why change can be a good thing and how these changes can ease the workload. Also confusion could be recognized as people were not sure of what they should do.

Some processes were adapted better than others but inventory reduction seemed to be the most difficult process and it was not adopted that well.

It was clear from the beginning that resistance towards change could be expected. I would not say that employees were satisfied with the current situation but they had gotten used to it. The resistance could be identified already in the early phase. Changes were questioned and in the meeting where the final changes were gone through the resistance was quite powerful. The written instructions, forms and process charts were downloaded to a database where anyone could access them.

Even with the written instructions and process charts some phases were carried out incorrectly. More training and updating the process would be necessary for obtaining the best possible result. Some shortcomings are only become apparent after the process has been used for a while. The ideas to improve the process should be continuous in order to achieve best results. This is done through continuous improvement.

A little after all new processes were put to practice, after sales department was informed that there will be internal changes. After those changes came in force, some of the processes became unnecessary and also the changes in resources were implemented.

Looking at the big picture, some improvements were made but some of the changes were never really implemented in full potential. From my point of view the best changes were related to the G1 and the delivery request form as well as to making simplified processes to meet the requirements of customer A.

After having more experience and a different point of view there are some things I would do differently now. Process development requires a wide understanding of the whole process and I think it is not possible to achieve that understanding without being a part of that process for a longer time. It is also very difficult to ask the right questions if you don’t know the whole entity. The most critical thing is to understand that each decision can have a huge impact on something else so each decision should be considered carefully. One very important thing is also to

rationalize all the changes and make sure that people are committed to the change. It is not reasonable to re-design processes if people will continue with the old model.

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APPENDIX 1 **Delivery Request**

Delivery Request

To be sent by email to forwarding and dispatch and attached on goods

Date: 4.9.2013

Handled by:

Project number:

CCRP /WaHa:

☐ "Pienet takuuosat" 795218

Delivery address

Contact Person:

Telephone number:

Terms of delivery

☐ DAP

☐ DDP

Following points must be specified in case of DAP or DDP:

☐ Urgent (1-2 days)

☐ Normal (3-7 days)

☐ FCA Vaasa

Following points must be specified in case of FCA Vaasa:

Way of delivery	Freight forwarder	Account number
☐ Courier		
☐ Truck		
☐ Other		

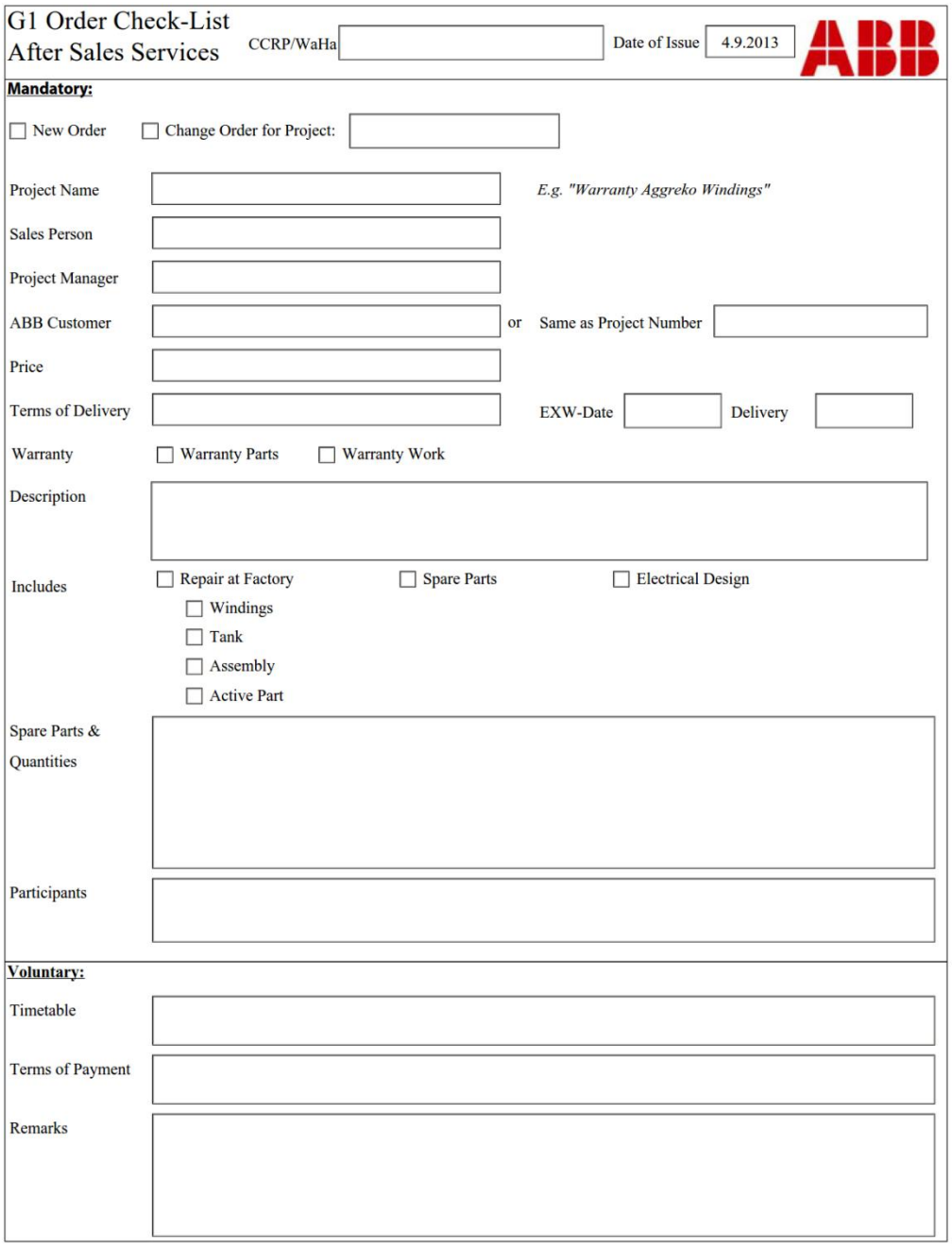
☐ OTHER, what?

Other information, marks and numbers

	SAP-Material	Description	Quantity	Proforma value, Eur
1				
2				
3				
4				
5				

Proforma value, total:

APPENDIX 2 **G1 Order Check-List**



G1 Order Check-List
After Sales Services

CCRP/WaHa | Date of Issue: 4.9.2013

Mandatory:

☐ New Order ☐ Change Order for Project:

Project Name		*E.g. "Warranty Aggreko Windings"*	
Sales Person			
Project Manager			
ABB Customer		or Same as Project Number	
Price			
Terms of Delivery		EXW-Date	Delivery

Warranty ☐ Warranty Parts ☐ Warranty Work

Description

Includes
☐ Repair at Factory ☐ Spare Parts ☐ Electrical Design
☐ Windings
☐ Tank
☐ Assembly
☐ Active Part

Spare Parts & Quantities

Participants

Voluntary:

Timetable

Terms of Payment

Remarks

APPENDIX 3 **Inventory Reduction**

Inventory Reduction,
ABB Oy Transformers

Date of Issue 4.9.2013

Project Number

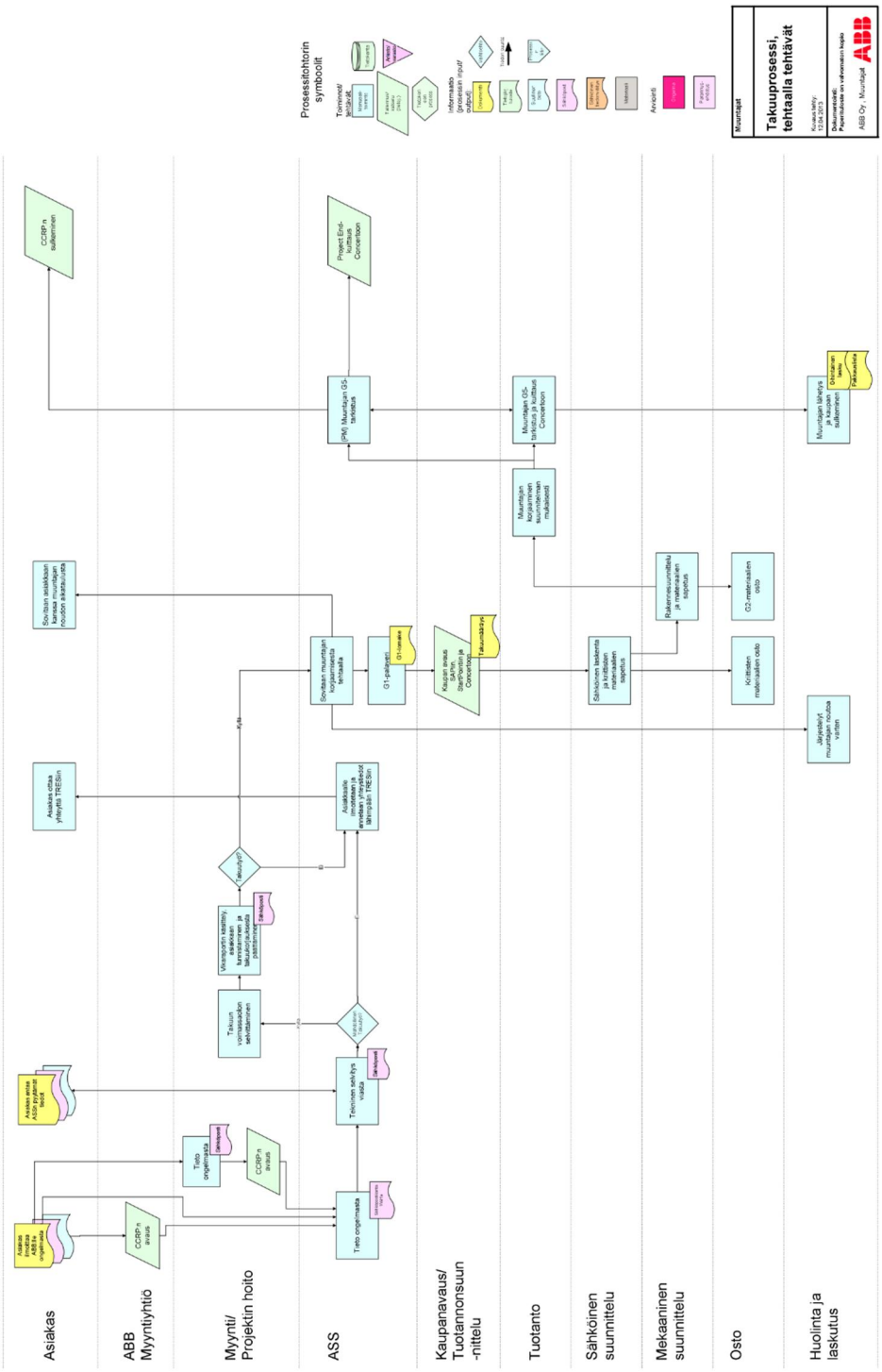
☐ 795218 Pienet takuuosat

CCRP/WaHa

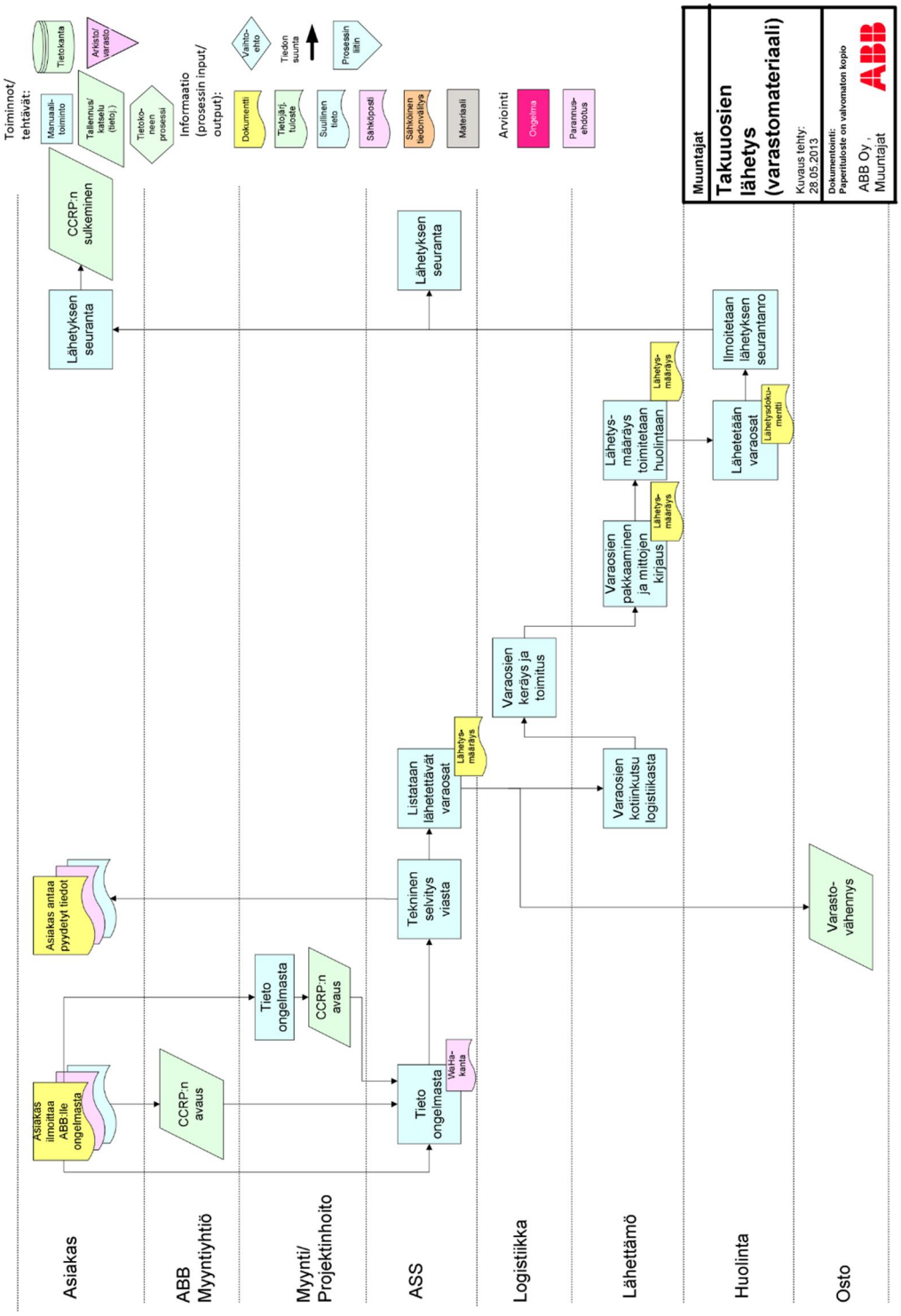
Name

	SAP-Material	Descripition	Amount
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

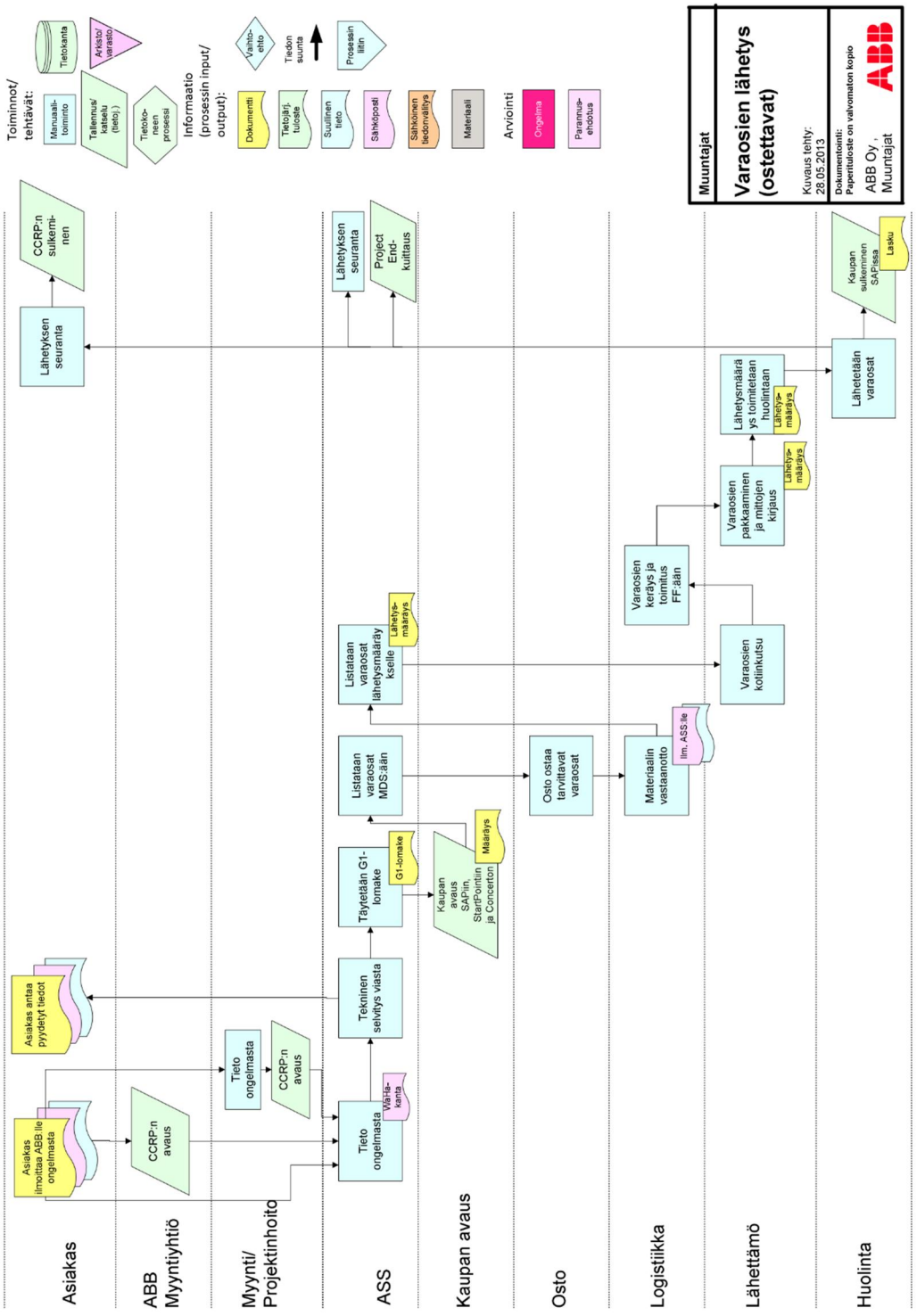
APPENDIX 4 **Warranty Repair at Factory**



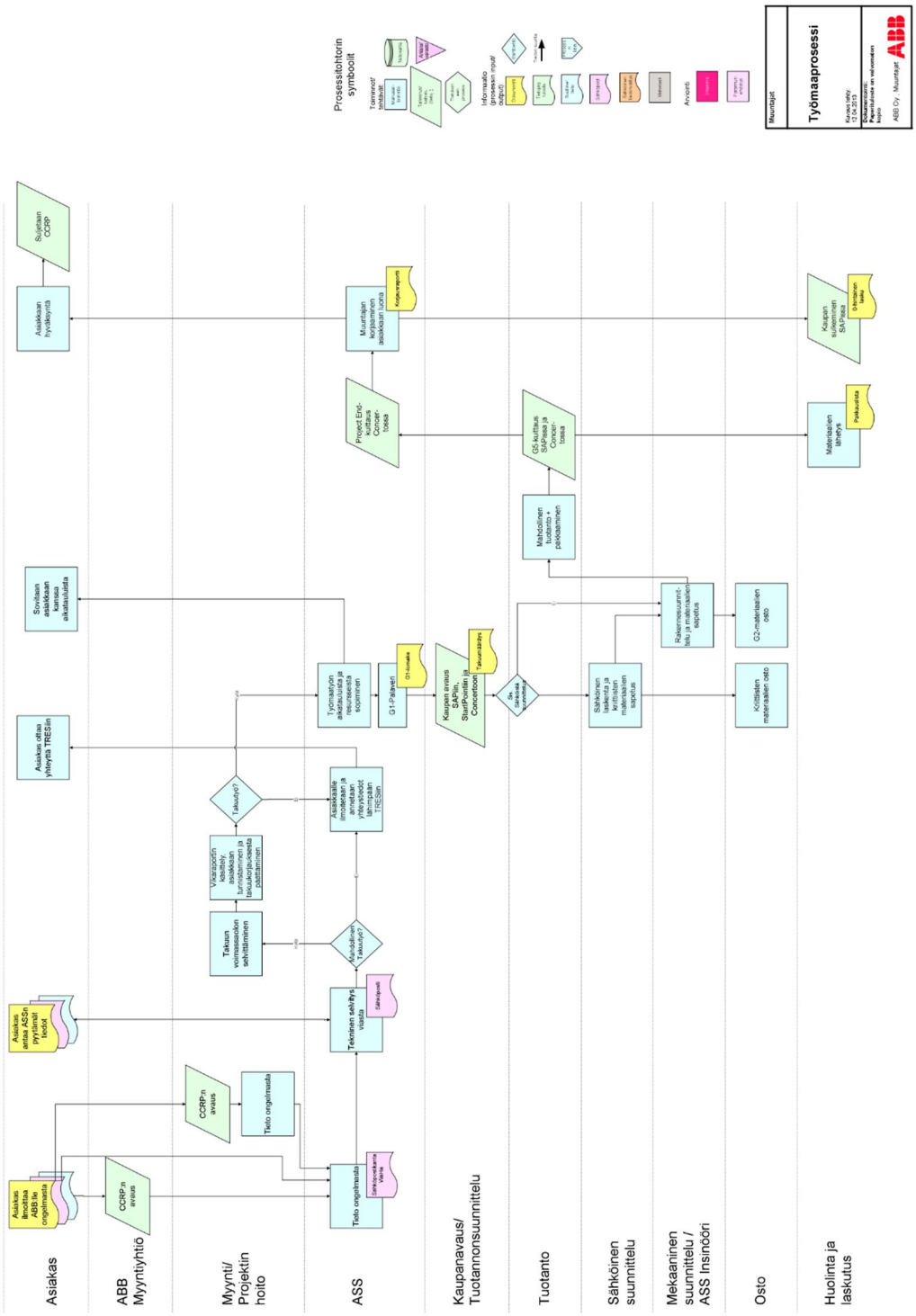
APPENDIX 5 **Sending Warranty Parts to Site; Stock material**



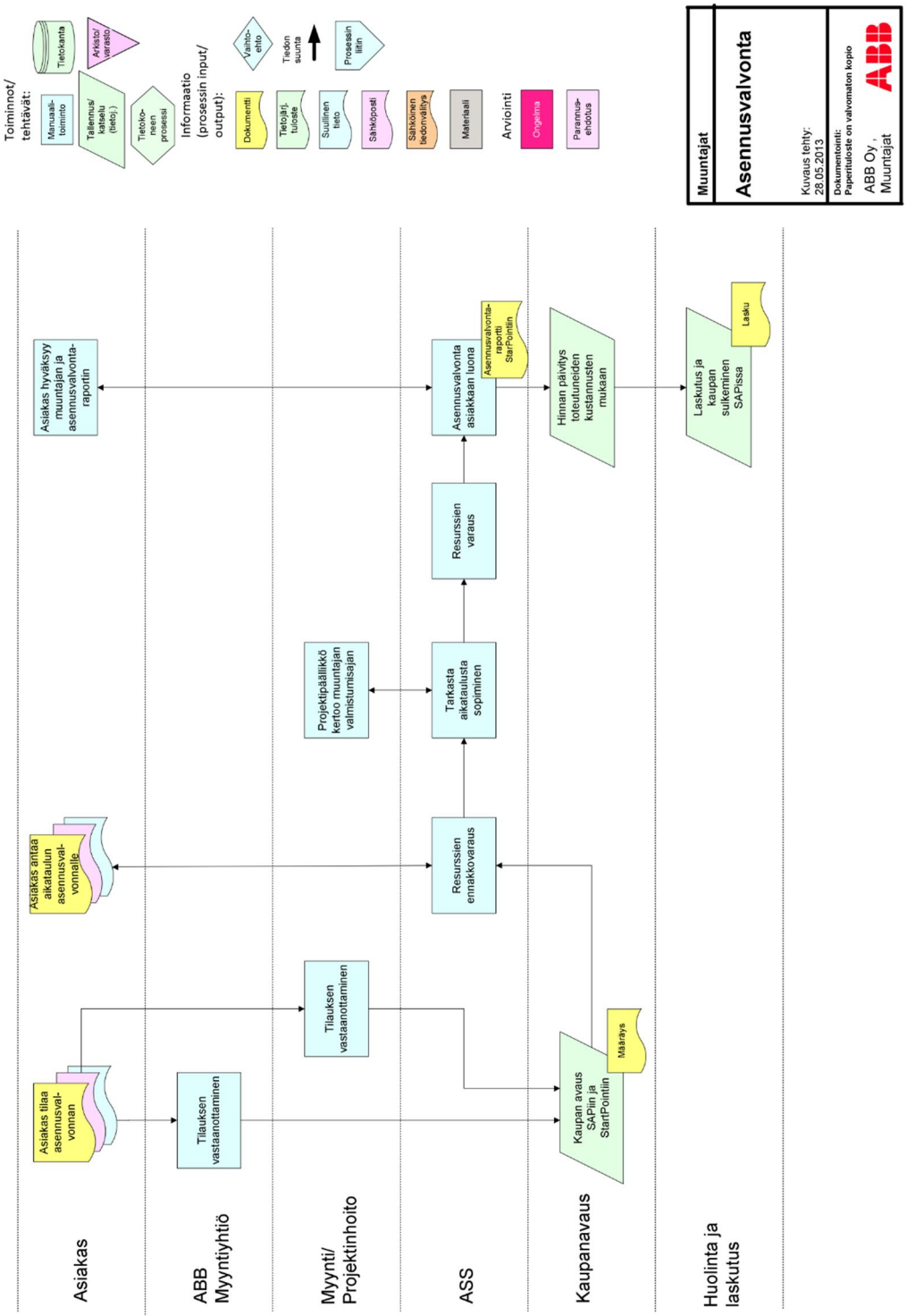
APPENDIX 6 **Sending Warranty Parts to Site; Purchased material**



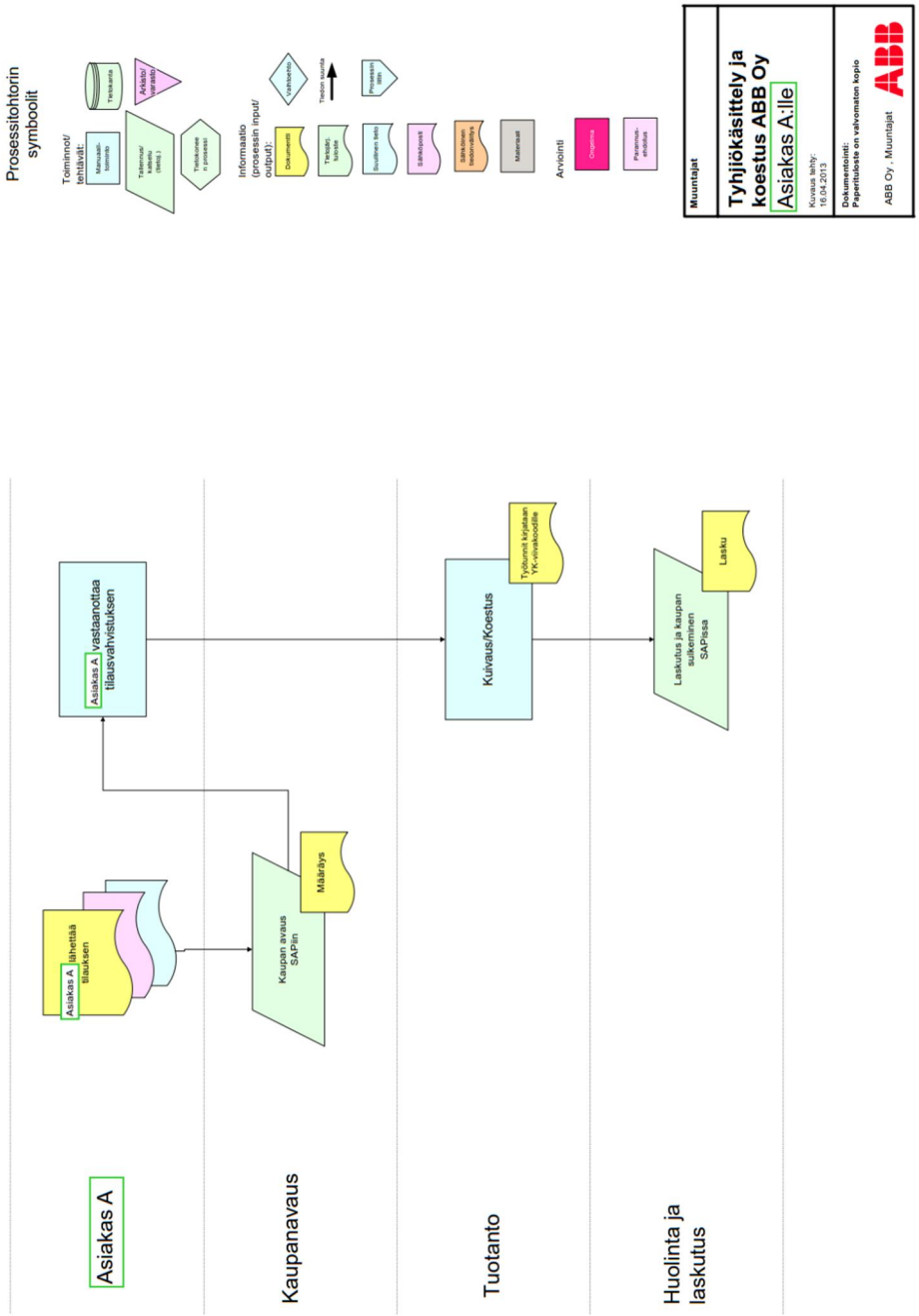
APPENDIX 7 **Warranty Repair at Site**



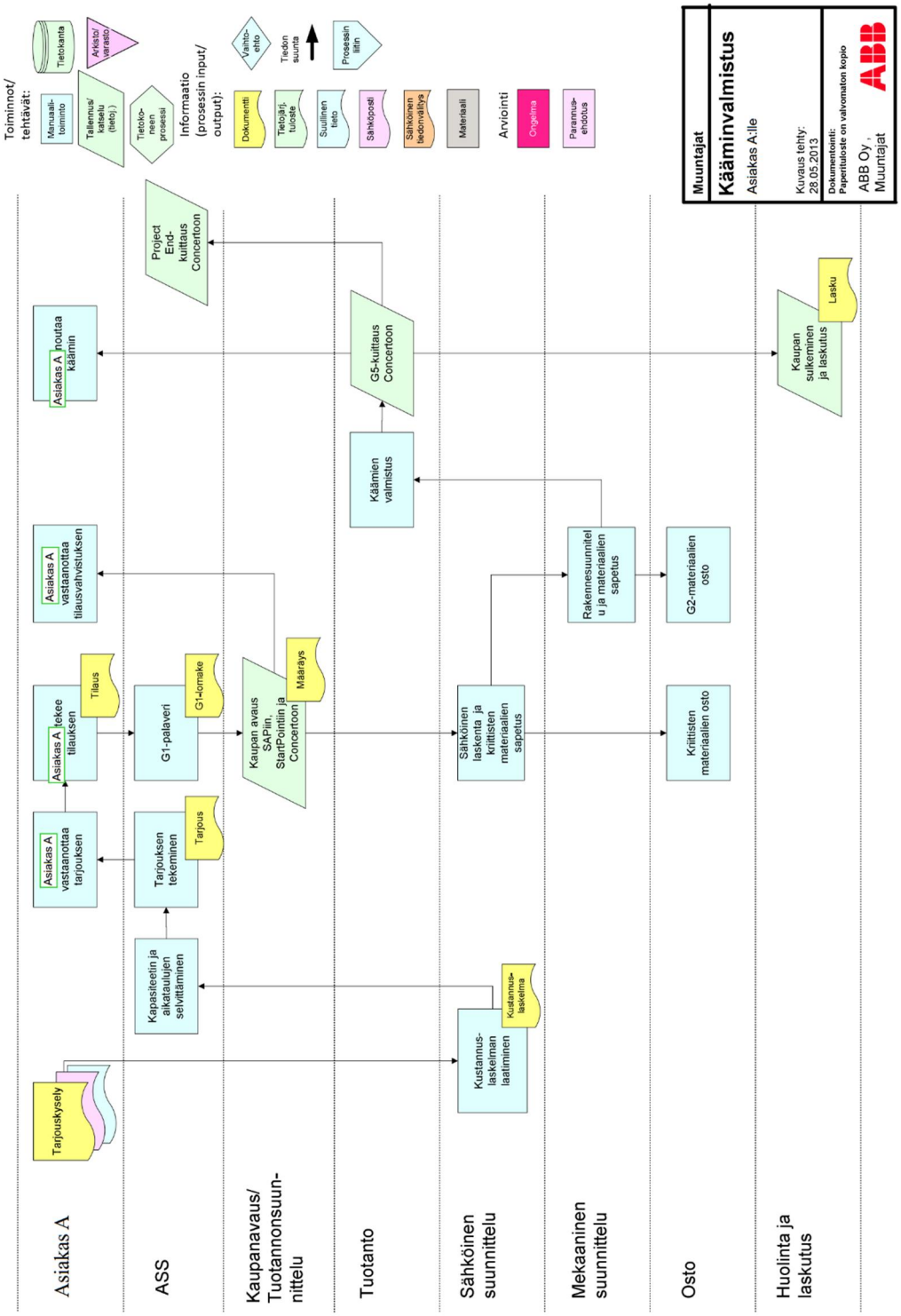
APPENDIX 8 **Comissioning Engineering**



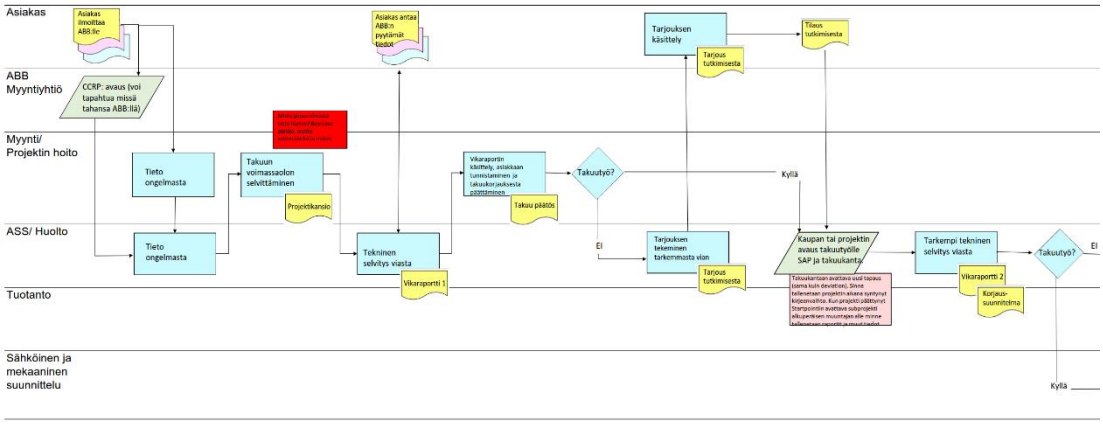
APPENDIX 9 **Customer A: Vacuum and Testing**

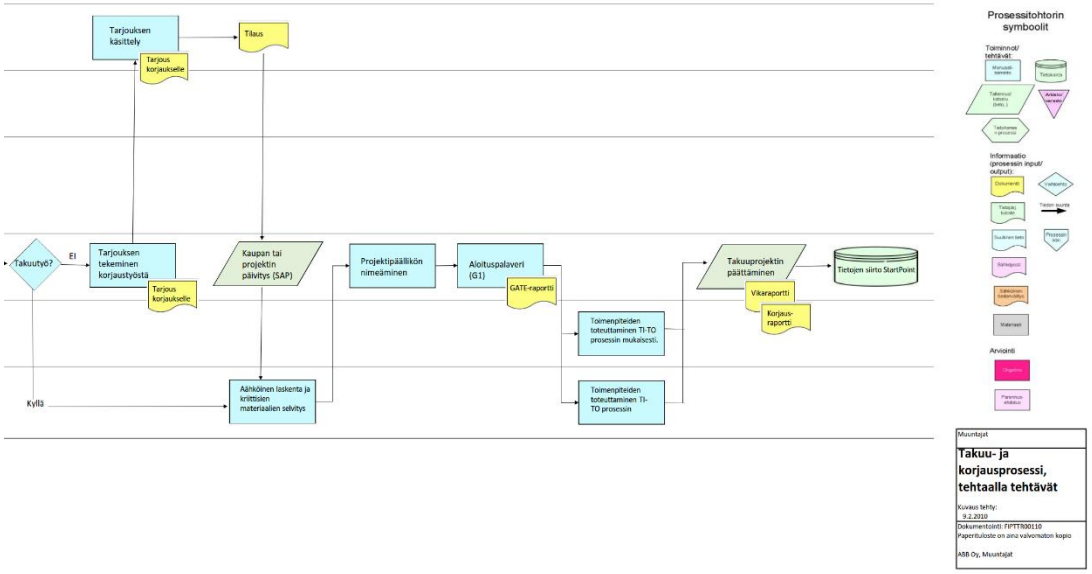


APPENDIX 10 **Customer A: Windings**

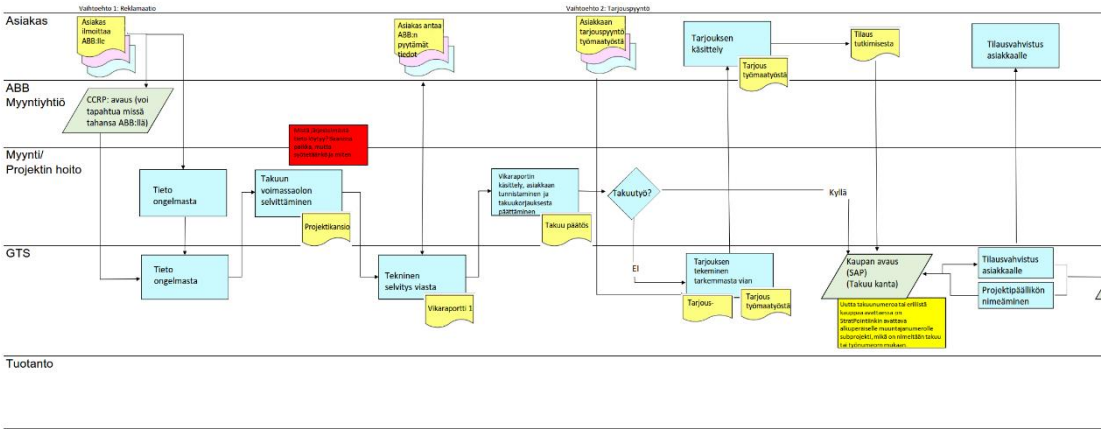


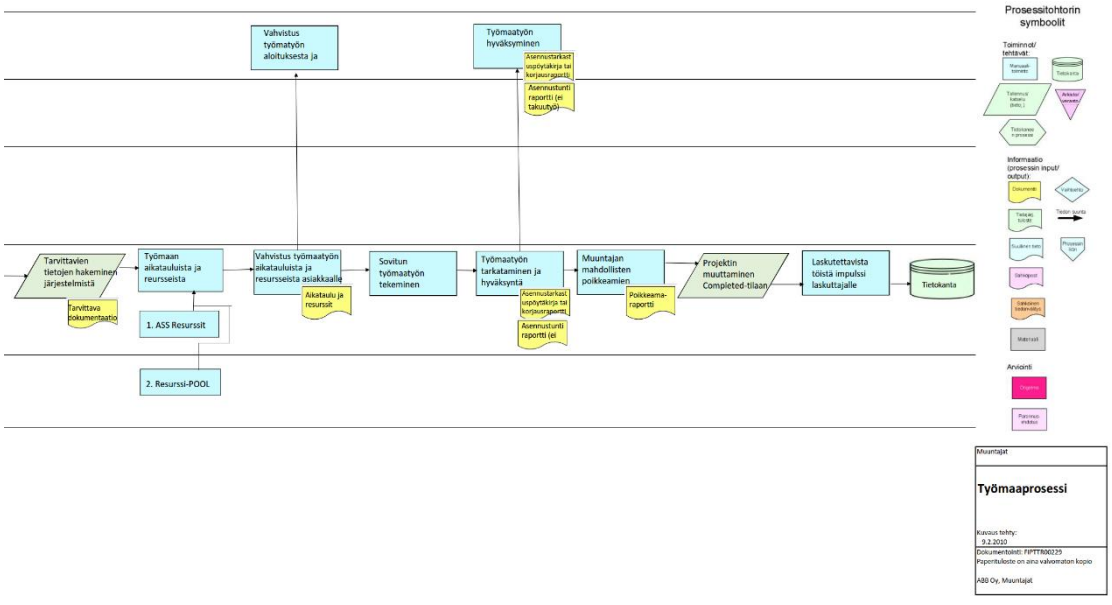
APPENDIX 11 **Original: Repair at Factory**





APPENDIX 12 **Original: Site Process**





APPENDIX 13 **Interview**

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APPENDIX 14 **Interview**

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APPENDIX 15 **Interview**

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