



HSE induction training concept development for ABB Oy

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The objective for this developmental research was to develop the HSE induction training of ABB Oy by creating a new HSE induction training concept. The development of the concept was done in co-operation with the experts and managers from ABB Oy Large Motors and Generators Helsinki, ABB Oy Motors and Generators Vaasa, and ABB Oy Drives Helsinki. The aim of thesis was to create a functional HSE induction training concept to be provided for a service provider to create an induction training for ABB Oy.

The HSE induction training concept was designed to be used as a tool for the new and existing employees to self-study the HSE matters of the factory with the training but was later identified also as a tool for the managers and the experts to use for inducting employees to the factory. The concept was created using the acquired information gained from reviewing existing internal documents of ABB Oy, semi-structured interviews, and from the workshop held together with the HSE teams and the HSE managers of ABB Oy large Motors and Generators Helsinki, Motors and Generators Vaasa and Drives Helsinki. The data collected and analysed from the document review was used to create the majority of the concept but was supported by the data collected from the interviews and the workshop. The theoretical framework of the concept was supported by legislation, standards and scientific literature on induction training. Alongside with the previously mentioned sources, articles on HSE related matters were also reviewed to gain information to support the theoretical background. Problems were faced during the data collection phase of the thesis due to communication issues and summer holidays in ABB Oy. The further development of the induction training was later delegated to the HSE team of Large Motors and Generators Helsinki.

Keywords: Induction, Occupational safety, Occupational Health, Environmental Safety

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HSE perehdytyskoulutuksen luonti ABB Oy:lle

Vuosi 2021 Sivumäärä 30

Tämän tutkimuksellisen kehittämistyön tavoitteena oli kehittää nykyistä HSE perehdyttämiskoulutusta ABB Oy:lle luomalla konsepti HSE perehdytyskoulutuksesta. Konsepti luotiin yhteistyössä ABB Oy Large Motors and Generators Helsingin, Motors and Generators Vaasan, ja Drives Helsingin tehtaiden asiantuntijoiden ja esimiesten kanssa. Opinnäytetyön tarkoituksena oli luoda toimiva konsepti HSE perehdytyskoulutuksesta, jonka pohjalta palveluntoimittajan olisi mahdollista luoda perehdytyskoulutus ABB Oy:lle.

HSE perehdytyskoulutuksen konsepti luotiin, jotta uudet työntekijät, ja osastolta toiselle siirtyvät työntekijät voisivat opiskella tehtaalla HSE aihealueen itsenäisesti. Konsepti tunnistettiin myöhemmin toimivan myös työkaluna jolla voitaisiin perehdyttää uusi työntekijä tehtaalle esimiesten tai asiantuntijoiden toimesta. Konsepti luotiin hyödyntämällä dataa jota kerättiin kirjallisuuskatsauksella ABB Oy:n sisäisille dokumenteille, asiantuntijoiden haastatteluiden sekä yhteiskehittämisen työpajan kautta yhteistyössä ABB Oy Large Motors and Generators Helsingin, Motors and Generators Vaasan, sekä Drives Helsingin HSE tiimin esimiesten ja asiantuntijoiden kanssa. Kirjallisuuskatsauksessa kerättyä ja analysoitua dataa hyödynnettiin luomaan suurin osa konseptista. Haastatteluista ja työpajasta kerättyä dataa käytettiin tukemaan kirjallisuuskatsauksesta kerättyä dataa. Konseptia tukeva teoreettinen viitekehys perustettiin lakeihin, standardeihin ja tieteelliseen kirjallisuuteen.

Työturvallisuutta, työterveyttä, sekä ympäristöturvallisuutta käsittelevät artikkelit tukivat myös opinnäytetyön teoreettista pohjaa. ABB Oy:n esimiesten kesälomat häiritsivät tiedonkeruuta opinnäytetyön aikana, sillä kommunikointi oli ajoittain katkonaista eri yksiköiden välillä. Tämän lisäksi, toinen tunnistettu ongelma ilmeni ensimmäisen työpajan jälkeen. Perehdytyskoulutuksen jatkokehityksen vastuu siirtyi Large Motors and Generators Helsingin HSE tiimille

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1 Introduction

The goal of the thesis is to develop a concept based on the existing Health, Safety and Environment (HSE) induction training by creating a self-learning training concept for new and existing employees of ABB Oy. The existing induction training is held by the supervisors of the employees, so the new concept would serve as a tool for the supervisor to relieve the current workload what is needed to induct a new or an existing employee changing departments to the company, and to give equal and a sufficient induction training for the employees of ABB Oy. The department specific induction training will be excluded from the thesis because of the nature of the work and the working environment. The supervisors of the new employees will continue to induct the new employees to the specific department and their work activities, but the induction to the company policies and the HSE culture alongside with the most central risks and hazards in the work environment will be inducted in the generic self-learning online training.

The history of ABB reaches as far as 19th century when a group of people started manufacturing generators, transformers, motors, and electrical lightning in Sweden under the name of Allmänna Svenska Elektriska Aktiebolaget, shortened as ASEA (ABB 2021c). The other half of the 19th century history of ABB took place in Switzerland where a group of people started to transmit high-voltage power as the first people in the world, the company was named Brown, Boveri & Cie, later shortened as BBC (ABB 2021c). Later during the 20th century, these two companies merged to create ABB with the headquarters in Zurich Switzerland (ABB, 2021c). After the merge, ABB continued pushing the boundaries of technology to drive performance of electrical solutions to the next level (ABB 2021c).

ABB is the leading manufacturer in electrification, motion, robotics and discrete automation, and industrial automation (ABB 2021a). ABB strives for sustainable solutions through electrification to contribute for better lives and help people around the world by reducing the harmful emissions and by persevering natural resources (ABB 2021d) ABB operates through the ABB operating model called the ABB Way, the operating model serves as the base of ABBs operations around the world (ABB 2021b). For example, ABB Way operating model provides ABB with standardized processes and policies to operate smoothly and safely by managing risks and fulfilling the requirements of the regulations set by the government through ABB Way processes and policies (ABB 2021b). The ABB Way operating model is visualized in the figure below (Figure 1.).



Figure 1 ABB Way operating model (ABB 2021b)

The HSE induction training concept will be created in co-operation with the experts and managers of ABB Oy Large Motors and Generators Helsinki, ABB Oy Motors and Generators Vaasa, and ABB Oy Drives Helsinki. The development of the HSE induction training will be researched from an HSE point of view to provide a thorough and holistic induction training for the HSE policies inside ABB Oy. The concept will be detailed enough and provides information for procurement of training solution from existing company training service provider. In the future, after the new induction training is finished and implemented and integrated to operations of ABB Oy Large Motors and Generators Helsinki, the induction training framework will be introduced to the other operations of ABB Oy and further developed for the use of ABB Oy.

2 Concepts for HSE induction training

The theoretical framework of the thesis includes the Finnish legislation on occupational health and safety, but as well as the environmental safety and protection. The ISO 45001 occupational health and safety management system standard is reviewed to gain information in occupational health and safety related matters. Alongside with the ISO45001, The ISO14001 and the ISO31000 standards are reviewed to understand the environmental management system and the requirements to safeguard the environment and the ecosystem and as well as to understand the risk management system and the processes what are used to assess, identify, analyze, and evaluate risks in organizations. In addition, scientific literature on new employee induction will be researched. To generically visualize how broad HSE is as a science, the basic principles of HSE are occupational health, occupational safety, and environmental safety. As seen on the figure below, each subject is tied to one another as the subjects correlate with each other (Figure 2).

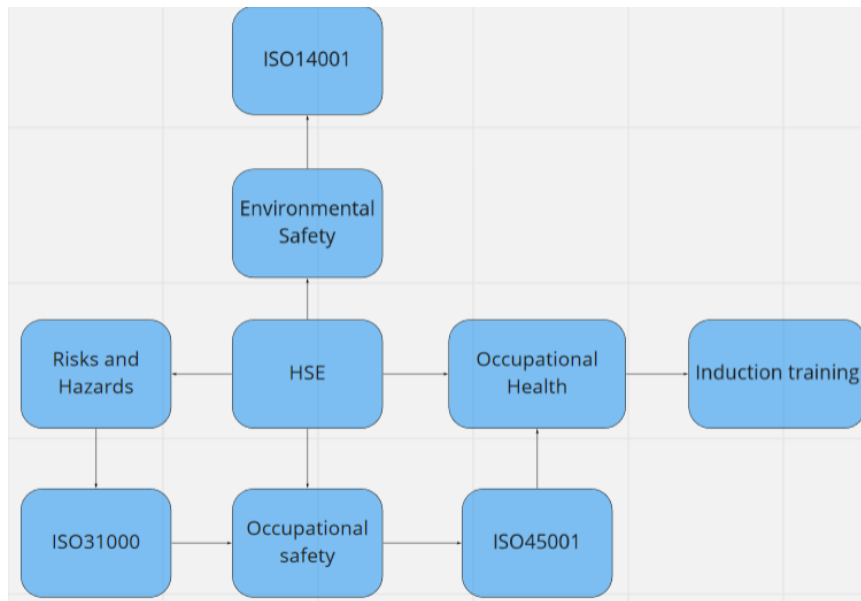


Figure 2 Main concepts

In the scope of HSE, the employer is responsible for ensuring the health and safety of employees alongside with the safety of the environment. This is mandated by the Finnish authorities and the regulations regarding to Occupational health, - safety and the environmental issues of Finland. Alongside of the Finnish regulations, ISO standards are utilized in meeting the requirements of the regulations set by the Finnish government but also developing the activities of the company (International Organization for Standardization [ISO] 2021).

The employer is responsible of ensuring the occupational health and safety of the employees by actively monitoring, assessing, planning, preventing, and eliminating any safety concerns regarding to the working environment, conditions and work activities, possible occupational diseases and illnesses as well as proactively improving its occupational health and safety performance. Unusual and unpredictable conditions and events what could have not been avoided by any precautions necessary for the work or the working environment are outside

The risk management standard ISO31000 will be analyzed and researched to gain understanding how the risk management standard and activities are affecting organizations and their activities. In the scope of HSE, ISO31000 is used to manage the activities to the related risks and hazards occurring in the work or the working environments of the stakeholders (ISO 2018, 6). Managing the risks and hazards is viewed as continuous improvement as organizations have to adapt to organizational changes and therefore continuously improve their risk management activities (ISO 2018, 13). Organizational changes can be minimal and only include new staff, but with new staff comes the importance of

inducting new employees to the organization and therefore the risks and hazards may occur even easier than before.

the scope of the responsibilities of the employer's duty of care. The employer is responsible of inducting the new employees to the working environment, - methods and the possible risks faced in the work activities, and how to prevent and avoid them using correct working methods, tools, and personal protective equipment alongside with different risk management methods. (Finland 2021.) Environmental safety is needed to meet the needs of protecting the environment without compromising the basic needs of the future generations with sustainable development and the protection of the environment against pollution and overconsumption of natural resources (ISO 2015, 5).

2.1 Occupational Health, - Safety and Environmental safety

Occupational Health, - Safety and Environmental safety also known as HSE, is needed in every organization, because organizations are responsible for the occupational well-being, - health, and - safety of the workers inside the organisation physically and mentally (ISO 2018, 5), but also to protect the environment and comply with the requirements of the governmental regulations and legislation on environmental matters (ISO 2015, 5). ABB is committed to provide a healthy and safe working environment everyone working in ABB owned or operated sites or facilities (ABB 2020). ABB is also committed on sustainability, and environmental safety and protection with complying and exceeding the legal requirements and laws set by the countries where ABB operates (ABB 2020). Safety is one of the core values of ABB and is in a key position in the everyday activities of ABB (ABB 2020). United States Department of Labor states that the most common violations of safety in 2020 were the violating the regulations on fall protection, control of hazardous energy as in lockout/tagout and fall protection training requirements (United States Department of Labor 2021). As these statistics may not necessarily apply to Finland, it is worth mentioning the importance of each and every of the previously mentioned violation because the same activities are practised in ABB Finland and worldwide in different ABB's locations.

2.1.1 Occupational health

Occupational health regulations are set to safeguard and prevent the possibilities for the employees to be affected of any occupational diseases and - illnesses, but also to upkeep and improve the wellbeing of the employees in different stages of lives at work (Finland 2021). The research and development of safer and healthier working environment, and - methods are executed in co-operation with the employer, the employees and the occupational health experts working for, or in the company (Finland 2021). The health of a new employee is inspected usually in the beginning of the employment, but there are differences between companies and their practises and policies on new employee health inspections (Tehy 2020).

The differences between the health inspections are tied to several factors regarding to the position the new employee is accepted to. During the health inspections, the employees are inspected by the occupation health experts based on their work activities and - environment keeping in mind the possible occupational diseases and illnesses that could emerge over the period of years working in the same position or the environment. Even though the health inspections are focused on the possible health problems from work and the environment that could affect the employee, psychosocial problems and substance use are also inspected with set of pre-determined questions to narrow down the possibilities of any problems emerging regarding to personal life or work-related stress what could affect negatively to the employees substance use or mental health. Occupational health inspections for the employees in permanent employment contract are also done in regular intervals assessed and set by the company in co-operation with the occupational health experts. These health inspections follow the same principle as the new employee health inspections. Taking account, the physical condition of the employee, the work activities, the environment, occupational diseases, and illnesses, and the psychosocial problems. (Työsuojelu 2021.)

2.1.2 Occupational safety

The occupational safety culture of companies operating in Finland are regulated and monitored by the Finnish government by setting laws what need to be fulfilled by the companies. Employees are responsible of following the regulations and the instructions set by the employer alongside with the instructions and responsibilities to maintain a safe and healthy working environment for everybody working in the company (Finland 2021). The employees are also responsible of reporting any exception, hazard or risks recognized regarding to the work methods, - environment, - machines or in personal protective equipment's that could affect the safety and health of employees or the environment (Finland 2021). The employees are required to eliminate or mitigate any of these exceptions, hazards or risks through the training received from the employer and within the boundaries of their professional skills (Finland 2021). After the exception etc. are removed or mitigated, the employee is required to report about the removal or mitigation of the exception etc. once again (Finland 2021).

While initiating to any type of work, or entering inside a production facility, personal protective equipment's set by the employer are mandatory to wear to protect the employees or employers of any harm what could be generated through an accident inside the facilities. The employee is responsible to acquire and provide the personal protective equipment's to all employees working in the company if the risk of illnesses, diseases or accident cannot be prevented or mitigated in the work environment through preventive measures (Finland 2021). If hazardous chemicals are used in the work environment the employer is responsible of documenting any hazardous chemicals in use. These documents are regulated so that the

employer is responsible of saving the documents at least ten years after the first use of the hazardous chemical (Finland 2021).

The centre for occupational safety states that the occupational safety and health policies of organizations defines the occupational safety and health goals, and the key point of the organizational policies is continuous and systematic development of the organizations occupational safety and health activities (The Centre for Occupational Safety 2021).

Organizations occupational safety and health policies are created based on the organizations assessed risks and hazards regarding to work activities and the working environment (The Centre for Occupational Safety 2021).

2.1.3 Environmental safety

Environmental safety as a science focuses on preventing injuries, illnesses, and hazards by identifying and evaluating the sources of the hazardous substances and limiting the source so it cannot harm any living organism or the environment (National Environmental Health Association [NEHA] 2021). Organizations in Finland are required to operate in a way that their operations do not harm the environment and the degradation of the environment can be eliminated with precautions. If the degradation of the environment cannot be fully eliminated, it must be restricted to a minimum (Finland 2014). The organization who operates in a way that can be harmful to the environment must nominate a competent person who will be responsible of the environmental matters (Finland 2014). This person will ensure that the environmental protection regulations are met with the operations of the organization (Finland 2014).

Environmental safety is a broad subject with multiple variables and different perspectives to keep in mind, as environmental health focuses on the prevention of injuries and illnesses inside organizations (Eastern Kentucky University [EKU] 2021). Even though environmental safety focuses on the prevention of injuries and illnesses inside organization, environmental health does not limit itself there. Environmental safety as the name states, the main purpose of environmental safety is sustainability and protecting the biodiversity of the environment by eliminating any potentially hazardous agents and minimizing the pollution levels what the organization produces (EKU 2021). The types of environmental safety hazards can be for example chemical hazards. Chemical hazards are a danger to the environment, to the atmosphere, and for any living organism, in this case for humans (Storemasta 2021). These types of hazards are considered as Physicochemical hazards what are caused by chemicals owning flammable, corrosive, explosive, oxidising, and chemically reactive characteristics (Storemasta 2021).

From the ISO14001 standard point of view, the standard states that the success of implemented environmental management system ISO14001 depends on the commitment of

organizational branches and operations (ISO 2015, 5). The organizational commitment correlates with the well-being of the environment and sustainability of the earth, because using the ISO14001 standard, organizations are possible to reach a better level of environmental protection and safety through the increase of sustainable solutions from their operations (ISO 2015, 5). If organizations could operate within the IS14001 management system, it would be possible to accelerate the sustainability processes and organizations to reach their sustainability goals within a shorter timeframe (ISO 2015, 31).

2.2 Induction training

Induction training is needed to induct the new employee for the applied job. The new employee is inducted to the working facilities and conditions, work and production methods, tools used in the work and the correct ways to use them, and to safe working practices (Finland 2021). The induction training is applied to new employees or employees who move on to new duties (Finland 2021). The new employees are given guidance on the prevention of hazards from the work, but also avoiding the hazards dangerous for the health of the employee (Finland 2021).

A well-executed and composed induction training serves the company especially in HSE related matters, because a well-planned induction results in fewer mistakes and provides the new employee with more knowledge and therefore better understanding of what is expected from the employee on the job and what are the employees responsibilities (Cadwell & Crisp 1988, 3). In comparison, a poor induction training or poorly organized induction training can hinder the creditability of the employer and result in bigger costs and lost time for the organization in the future (Cadwell & Crisp 1988, 25). A poorly planned induction training also does not provide the employee the required information in a fluent way and may require more re-training and inducting in the future (Cadwell & Crisp 1988, 25). When thinking about HSE as the subject of induction, not providing the employees enough information to work safely is hazardous and can lead to minor incidents, in the worst case the minor incidents can build up towards a major incident what can be disastrous.

2.3 Risk management in HSE

The concept of risk is often viewed only as a negative event which is expected from an act or a result from an event. The ISO31000 standard states that risks can be negative, positive, or even both (ISO 2018, 6). Risks are often multilateral and can own different traits and risk categories and levels where the risk is applicable (ISO 2018, 6). Usually, risks are defined or stated in different terms such as, the risk source, the potential events, the consequences, and lastly the likelihood of the risk to occur (ISO 2018, 6).

The process of identifying, assessing, and treating a threat is referred as risk management (TechTarget 2021). The systematic and proactive approach to managing risks provides organizations a tool to identify and control the threats faced by the organization and to minimize the impact what an unexpected event caused by a risk could create (TechTarget 2021). By implementing a risk management process, the organization can save resources and protect the well-being and the safety of the organizations employees (TechTarget 2021).

The Risk management standard ISO31000 as It name states focuses on risk management principles (ISO 2018, 5). ISO3001 provides the users with principles, frameworks, and processes to manage risks associated with the operations of the organization and other risks faced by the organization (ISO 2018, 5). The risk management process of the standard provides the user with a systematic approach to approach and manage the risk from the start to the end.

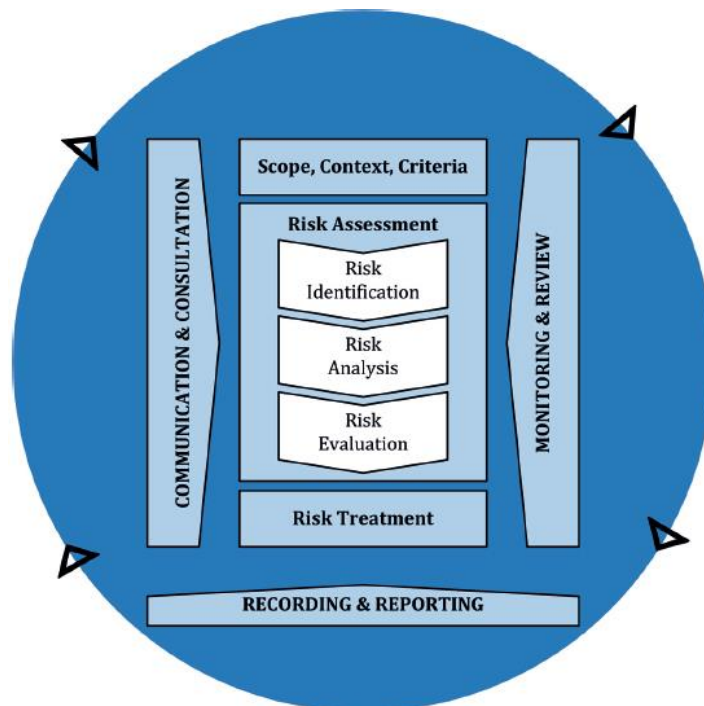


Figure 3 Risk management process (ISO 2018)

The risk management process (Figure 3) consists of six different phases with several sub steps included. Setting the scope, defining the context, and defining the risk criteria are the first steps on customizing the risk management process to enable appropriate treatment for the risks. This is achieved by defining the scope of the risk management process and understanding the external internal context of the risk (ISO 2018, 13). But the most practical part of the management process is the risk assessment phase which involves risk identification, risk analysis, and risk evaluation followed by the risk treatment. During the risk assessment phase, the risks and the factors what are contributing for the identified risk

are assessed for further evaluation for the required risk treatment. The risk assessment process focuses on identifying possible risks and hazards, evaluating the likelihood of the risk occurrence, and analysing the nature of the risk as well as the complexity and the possible consequences caused by the risks and hazards (ISO 2018, 13-15). The risks are also evaluated to determine the appropriate risk treatment and the resources to be allocated for the given risk (ISO 2018, 17). Usually, the risk management process is used for risks that are hazardous and can lead to minor or major consequences if not treated, but the risk management process can also be used to evaluate the profitability of a project or an investment if required (ISO 2018, 15).

3 Methodology

The data collection phase of the thesis and the creation of the concept was approached from a service design of point of view and was created by using qualitative research methods. This was done to generate an HSE induction training concept which serves as a database for the service provider to create the induction training. After each data collection phase, data analysis was done to separate the relevant data from the non-relevant data to ease the holistic data analysis in the development phase of the induction training concept.

Two types of interactive data collection methods were used in the data collection phase of the thesis. Semi-structured Interviews and a workshop was held to collect data, develop a functional framework for the induction training, and narrowing down the scope of the induction training. The research process is explained in the figure below (Figure 4).

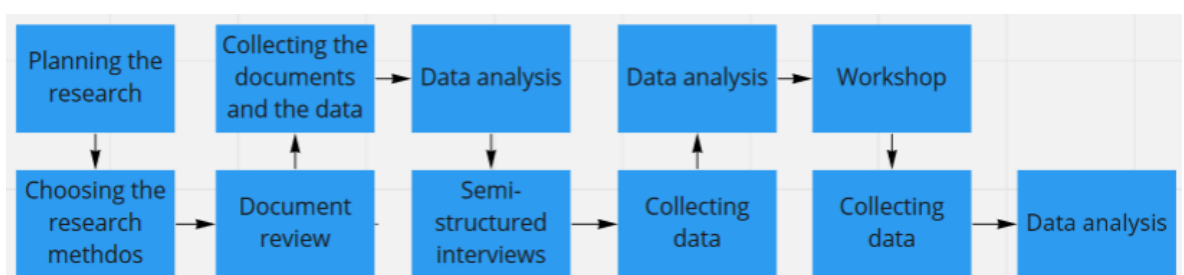


Figure 4 The research process

After the literature review, data collection and data analysis were finished, the creation of different concept prototypes began. Based on the feedback of the prototypes, the best concept prototype was selected and developed further to the final concept which was planned to be provided for the chosen service provider for the creation of the induction training. The comparison of different service providers learning platform and services, and

the selection of the final service provider was excluded from this thesis and will be done outside of the scope of the thesis.

Document was used to form a part of the theoretical framework for the thesis. Document review was the initial stage of conducting research. In the initial stage of research, it is necessary to understand the development target, the context of the research or the development topic, and the possible disruptions (Stickdorn et al 2018, 118). During document review, collecting reliable sources from the organizations database and from external sources regarding to the development topic was also needed to dig deeper into the topic and gain more insight about the topic (Stickdorn et al 2018, 118). In this case, document review was conducted to gain a deeper understanding about the current HSE induction training and the development possibilities, alongside with inducting a new employee to an organization. The occurring trends and the need for emphasis of different issues were also analyzed in cooperation with the production supervisors of Large Motors and Generators Helsinki, HSE team of ABB Oy Large Motors and Generators Helsinki, The HSE manager of ABB oy Motors and Generators Vaasa, and the HSE manager of ABB Oy Drives Helsinki. Literature on inducting new employees was researched to understand the importance and the benefits of a well-organized induction training (Cadwell et.al 1988, 3), responsibilities of the employees and organizations on occupational safety and -health matters alongside with environmental safety obligations, and the internal publications of different factories of ABB Oy was used to define the subject, the scope, and the required information included in the HSE induction training concept.

To gain information about the development target, the current situation of the organization and its issues and development needs, it is necessary to analyse the existing data with the document review research method. Document review as a method is a way to collect data from documents by reviewing them (CDC 2018). Document review as a research method can be used for any type of document such as electronic copy, reports, and performance ratings to gather information from existing documents to help the researcher understand operations of the research target and to acquire information to help in the framing of content of the development target (CDC 2018).

3.1 Document review

During the data collection phase of the thesis, document review was used to gather existing data from ABBs internal documents to guide and create an early framework for the HSE self-learning induction training for further development. This was done by assessing the existing documents and the need, then accessing and selecting the relevant documents identified in the assessment phase (CDC 2018). After accessing and selecting documents based on the need, the selected documents were gathered into a single spreadsheet navigation tool for

better and more practical access to the documents through links. After all this was done, the document review took place, and a summary of the documents was created to frame the early framework. The document review took part in the initial stage of the data collection because of the nature of the data collection method was identified as the most time-consuming method out of the other selected data collection methods.

The problem what was inevitable during the data collection phase of the thesis was the amount of so-called biased information from the documents and the possibility of reviewing outdated content, because most of the reviewed documents was provided from ABB Oy Large Motors and Generators Helsinki. However, these problems were eliminated during the first workshop session with the help of the stakeholders by brainstorming and determining the actual scope and the topics for the material of the training alongside with possible pop quizzes and a final exam during the training. The other possible problem can be the status of the document. The current state of the document is important on the validity of the information, if the document is outdated and has not been updated or is the wrong revision of the correct document, this can lead to outdated or inaccurate information on the subject (Bryman 2012, 306, 307).

The document review was done by accessing a set of documents regarding to new employee induction and the induction checklists regarding to new employee induction. Alongside with new employee induction material, environmental safety and sustainability materials were reviewed such as the induction material to environmental matters which included topics such as energy efficiency, lowering the carbon footprint of ABB and recycling inside of ABB Oy. Most of the documents were created by Helsinki Large Motors and Generators HSE team, but documents from Vaasa and Drives Helsinki were reviewed to eliminate any possible biased information or practices. Because different practices are followed in every location excluding the mandated practices by the law and regulations, the need for multiple documents discussing the same subject was needed from different locations. Document review had to be done a second time after the interviews, because of the interviewees provided more documents to be reviewed and therefore more data to be analysed with the document review method.

The document review of the occupational health matters was done in co-operation with the occupational health experts of Large Motors and Generators Helsinki occupational healthcare unit during Microsoft Teams interview. The document subject reviewed together with the occupational health experts was about ergonomics. During the document review part of the interview, the review narrowed down the information and the practical examples to be inducted in the new induction training.

3.2 Semi structured interviews

Covid-19 affected the interview arrangements in such way that the interviews had to be held online in Microsoft Teams to eliminate the risk of getting infected with the virus. The structure of the interview was similar in every interview even though the interviews were held as semi-structured. The participants of the interview represented their own area of expertise on different fields. The interviewed experts were responsible of the following fields of expertise: Environmental safety, Electrical work, Occupational health, and lastly Occupational physiotherapy.

Semi structured interviews were conducted to gather data from the production supervisors of different production lines to discuss the needs of further developing the existing practical information inducted in the self-learning HSE induction training, such as electrical safety, rigging and slinging, and environmental issues. Also, some of the structure of the concept framework was developed in co-operation with the interviewees. The benefit of the semi structured interviews comes from the continuous usability from the inclusion of the experts to the interview, this is a benefit in organizations if there is a need for a further development in the future (Hirsjärvi et al 2009, 206). Because of the nature of the production lines activities, the interview questions were used as leading questions for open discussion with the supervisors. Semi-structured interviews require more knowledge about the subjects in order to be effective, because the interview can change direction from an interview to an open discussion (Hirsjärvi et al 2009, 209). The interviews took place during June because of the summer holidays of ABB Oy in July could have disrupted the interviews and the fluency of the data collection. The interviews was the second data collection method used in the data collection phase of the thesis. List of exact questions is found in the appendix (Appendix 1).

The interview was held online together between the researcher and the supervisor/expert responsible of the area of different expertise such as Environmental safety, Electrical work, and Occupational health experts. The structure of the interview followed the same patten in the beginning of every interview but continued differently after the beginning. The fluency of the interview was heavily affected by the professional skills of the experts but was led by the interview, if necessary, by pre-determined set of backup questions to gain the minimum necessary data to develop the framework and the practical information required in the training. The minimum required data from the interview was set by the researcher to at least three main headlines for the specific area which can be later used to narrow down the scope and the required information to be inducted in the training.

3.3 Co-creation

Co-operative research and development activity between different stakeholders is called Co-creation. Co-creation is an easy and quick way to research and experiment different topics

but requires a well-structured framework to be efficient and to provide the desired data. In Co-creative workshops, different experts are gathered into a space to ideate and develop the given topic and share the ideas for further development (Aaltonen et al 2016).

Co-creation is an excellent way to create new Ideas, products, and concepts together with other researchers or pre-determined participants, but the co-creation sessions do need to be well organized and structured for them to be useful. The collaboration in a co-creation session starts with defining a clear common problem identified and understood with the participants (Ruoslahti 2018). Sometimes the common problem is clear for each party before the co-creation sessions starts, but it is necessary to re-acknowledge the problem in the beginning of the first co-creation session to eliminate any uncertainty or confusion. Co-creation workshop will be the final data collection method used in this thesis because of the nature of the method requires preparation for the agenda of the workshop as well as for the creation of the prototype framework of the HSE induction training to be presented for the participants for ideation and further development.

3.3.1 The workshop

The workshop was held to research and set the scope of the self-learning concept for the HSE induction training. For the workshop the chosen managers from ABB Oy Motors and Generators Helsinki and Vaasa, ABB Oy Marine Helsinki and ABB Oy Drives Helsinki took part to research and set the scope for the training concept. The scope determined what is considered as generic information and what would be considered as division specific information.

In the beginning of the workshop, the goal and the scope of the thesis was briefly introduced for the participants to clarify the scope of the thesis and what is the desired outcome of the thesis. The goal and the scope of the workshop was introduced to the participants to understand the scope of the subject for eliminating any topics outside the scope, subjects outside the scope could include for example HR related issues or department specific information. For better results, the scope of the thesis was reviewed again during the workshop and after the workshop has been finished.

After the introduction, the current state of ABB Oy's HSE induction training and training plan was reviewed to clarify the development target and to raise questions and ideas in the initial stages. An idea for a new direction for the HSE induction training was presented for the participants with the prototype HSE induction training concept framework. The idea was presented for the participants so the participants could think about the possible development ideas for the framework inside the scope of the thesis. But also, other functionalities outside the scope of the thesis, and to clarify the direction the HSE induction training is going.

During the workshop, the prototype was presented and was gone through step by step by discussing each subject in the HSE induction training prototype. After the review of the prototype and the discussions held based on the subjects, pre-determine questions was presented to the participants to openly answer. The list of exact questions can be found in the appendix (Appendix 2).

Due to restrictions created by the summer holidays in ABB Oy, the workshop had to be held in separate sessions, first together with ABB Oy Motors and Generators Vaasa and ABB Oy Drives Helsinki, and then separately with ABB Oy Large Motors and Generators Helsinki. The HSE managers of ABB Oy Vaasa and ABB oy Drives Helsinki participated to the first session of the workshop. Alongside with the HSE manager from ABB Oy Drives Helsinki, an HSE trainee from Drives was taking part to the workshop too to gain better understanding to the area of HSE and to co-create the HSE induction training.

After the workshop, a wish list about the division specific information was gathered to consider the possibilities what division specific information can be included and what has to be excluded to form a functional HSE induction training self-learning concept. Even though the participants attending the workshop will be representing a different field of industry and product lines, the problems and development target are commonly shared. The need for developing a new concept for the common HSE induction training is shared among the stakeholders.

3.4 Problems during the data collection

The fluency of the interviews, and the initiation of the workshop was disturbed by the summer holidays of ABB Oy experts and managers. Even though the fluency was disrupted, the interviews and the workshop were a success but had to be done in a wider timeframe and required more allocating of time and re-scheduling to be functional. Few problems were also identified during the data collection and during the creation of the HSE induction training concept which had to be acknowledged and eliminated by further developing the concept and allocating responsibilities from the service provider to ABB Large Motors and Generators Helsinki HSE team.

The workshop was easy to organize, and the data collected from the workshop was helpful on creating the final framework for the HSE induction training concept. However, the factory specific practises and information such as emergency exits from ABB Oy Motors and Generators Vaasa and Drives Helsinki could not been acquired because of communication issues from the behalf of the two factories. So, the factory specific information had to be excluded from the data collection from the workshop.

During the initial stage of the thesis, the plan was to organize two workshops. The second workshop was planned to be held together with a selected service provider to discuss the possibilities of delegating the creation of the training material and the actual training for the service provider. The second workshop together with the service provider was cancelled because of identified problems emerged on the creation of the final training material for the HSE induction training. After the first workshop was finished, the separate session with the HSE team made clear that there were problems on the creation of the final induction training material. The creation of the training material was problematic because ABB's operations are not familiar to service providers creating training solution for ABB. The differences between ABB's production areas and factories are broad, so it would be difficult for the service provider to tailor a training for each, and every factory based on the information from the concept. So, the responsibility of creating the training material for the HSE induction training was delegated to the HSE team of Large Motors and Generators Helsinki.

4 Results

In this section, the results from the data collection will be presented. The used methods were document review, semi structured interviews and workshop. The data gained from the document review, the interviews and from the first workshop provided enough data for the creation of the HSE induction training concept.

4.1 Results of the document review

The document review was done to existing documents regarding to inducting a new employee to different locations of ABB Oy. In this case, the locations were ABB Oy Large Motors and Generators Helsinki, Motors and Generators Vaasa, and Drives Helsinki. These documents included vital information on identified high risk work activities practised in the locations, but also such topics as environmental safety and sustainability.

After the document review and the data analysis was done, the topics were identified and collected in the Excel spreadsheet tool. The identified topics to be inducted in the HSE induction training from the data gained from the document review was identified as following: Working at heights, rigging and slinging, working with forklifts, electrical work, and chemicals. Alongside with these work activities, environmental safety and sustainability, personal protective equipment, occupational health and physiotherapy were identified as a one major subject to be inducted for a new employee.

4.2 Results from the interviews

The interviews provided information on the topics identified during the document review stage of the data collection phase based on the expertise of the participants. The interview differentiated with the amount of data and documents the experts could provide for the development of the prototype framework concept. The amount of data and documents the interviewees could provide differentiated, because the scope of the subjects was different, some of the subjects were narrow and some were broad in comparison with each other. Even though the amount of information gained from the interviews were different, the data was still reliable and useful for the HSE induction training concept development. The interviews of individual experts during the data collection phase did not create any problems and were easy to manage and schedule.

From the interviews with the experts representing environmental safety, electrical work, occupational health, and occupational physiotherapy, the most important topics were identified for induction. During the interview with the environmental safety expert, the most important identified topics were safe use of chemicals, correct use of personal protective equipment and the role of the product of ABB Oy in fighting the global warming. During the interview with the electrical engineer of ABB Oy Large Motors and Generators Helsinki, the most important identified topics were who can do electrical installations in the factory and the 7 steps practise on electrical work, this is one of the life saving rules ABB has made to protect the health of their manufacturing employees. During the interviews with the occupational health and the occupational physiotherapist, the importance of ergonomic working habits and the importance of taking micro breaks was identified as one of the most important topics to be inducted for the new employees through the HSE induction training. Alongside with the previously mentioned topics, workplace audits and why they are conducted, and the occupational health services of different ABB Oy's locations were also identified as important topics to be inducted in the training.

4.3 Results from the workshop

In the beginning of the first session of the workshop, the purpose of the thesis and the workshop was introduced shortly for the participants. The purpose of the workshop was to set the scope for the concept framework to determine how generic should the HSE induction training be. After the brief introduction, the current state of the new employee induction was reviewed and discussed together with the participants. After recapping the current state, the prototype framework of the induction training was introduced to the participants and explained the structure of the prototype framework. While introducing the prototype framework for the participants, a conversation was carried out based on the completion the induction training and how to document the completion for monitoring purposes. A suggestion

was made to transfer data after completing the induction training from the training portal to SAP management system. This data was needed to make sure that the new employees completed the training and are committed to follow the instructions and regulations inside ABB Oy.

After the conversation, the pre-determined questions were presented to the participants one question at a time. After the questions had been answered, the induction training concept had been identified to work best as a generic concept. The answers narrowed down the scope of the induction training and made things easier in the final phase on creating the actual induction training material, because the scope was set to be generic, and the topics were straight forward and clear. The list of questions can be found in the appendix (Appendix 2).

A data sheet was presented for the participants for gathering factory specific information. The participants were asked to fill in the key points and their specific information to be inducted based on their specific location and factory. Because of the differentiating working environment and products, different types of information are required to be inducted in different locations. Even though there are similar topics to be inducted in each factory, the information will be always different in every location, such as the location of emergency exits and first aid kits etc. The factory specific information was not collected because of communication issues caused by the summer holidays of the HSE managers of Motors and Generators Vaasa and Drives Helsinki.

The second session of the workshop was held together with the HSE manager of Large Motors and Generators Helsinki due to summer holidays. In the workshop, the data and ideas collected from the first session was reviewed and analysed, and the development of the framework was approved for finalization. The topics were set and approved, but the topics were scattered around the framework. So, the framework did not yet serve the purpose as a concept where it could be possible to create a functional HSE induction training from the concept.

4.4 The prototype HSE induction training concept

The prototype framework for the concept of the HSE induction training was created from the acquired information from the document review, the interviews and from the first workshop in the initial stage of the co-creation phase. The prototype framework consisted of all the required information what a functional HSE induction training should include from ABB Oy Large Motors and Generators Helsinki, ABB Oy Motors and Generators Vaasa, and ABB Oy Drives Helsinki perspective. The framework still needed some finishing because it was a bit rough around the edges. The chapters and the subjects needed to be narrowed down and combined, because some of the matters were so similar and were relating to each other

sharing common traits to make the induction training framework more practical in the study material creation phase.

When creating a concept, I think that it is necessary to be systematic and have a clear vision what needs to be included and what has to be excluded from the concept, because different parties perceive certain topics differently and have differentiating perspectives for example how broad a concept should be. My personal point of view is that framing the concept clearly may be ignored in the beginning of the concept development, but it is important to do so for the concept to be functional and not to leave any room for miss interpretation from the subject matter, the topics, and for the main goal of the concept. When developing an existing practise or creating a concept, it is helpful to create simple digital tools to keep up with the data, the documents and manage the development process of the subject.

Using the acquired information from the interviews and the workshop, the prototype concept was developed to the final stage in a separate session with one of the HSE specialists from the Large Motors and Generators Helsinki HSE team. In the beginning of the session, the concept was introduced for the specialist for further development. In this stage, we realised that the concept was not enough for the service providers to generate the HSE induction training for self-learning purposes because the service provider was not familiar on the operations of ABB Oy. This meant that the responsibility of creating the training material needed to be delegated for the HSE team of ABB Oy Large Motors and Generators Helsinki. The concept was further developed to a tool to serve the team as they would be the people responsible of creating the final training material for the HSE induction training.

The structure of the induction training was outlined in Microsoft PowerPoint to give a clear view of the length of the HSE induction training based on the number of topics on the framework. The number of topics were 70 to be inducted, so it was necessary to narrow down and combine the topics which shared similar traits or were connected somehow to narrow down the final induction training. After the session, the induction training was narrowed down from 70 topics to under 30 by combining the similar topics to a broader subject matter. After finishing the outlining and reframing the concept and the topics, the Microsoft PowerPoint file was later identified as the final product for ABB Oy for the creation of the HSE induction training because the format was clear and provides the HSE team a functional tool to work with.

The main topics are listed on the list below. In the concept, the topics are divided between factory specific information and the practises set by the company. This was done to distinguish the line between factory specific and company specific information for easing the tailoring process of the HSE induction training between different locations of ABB Oy. The main topics include several slides of information with different subtitles. The topics are not in

the absolute final order and might be re-structured differently than in the listing below after creating the training material and finalizing the induction training. The structure of the HSE induction training concept is visualized in the figure below (Figure 5).

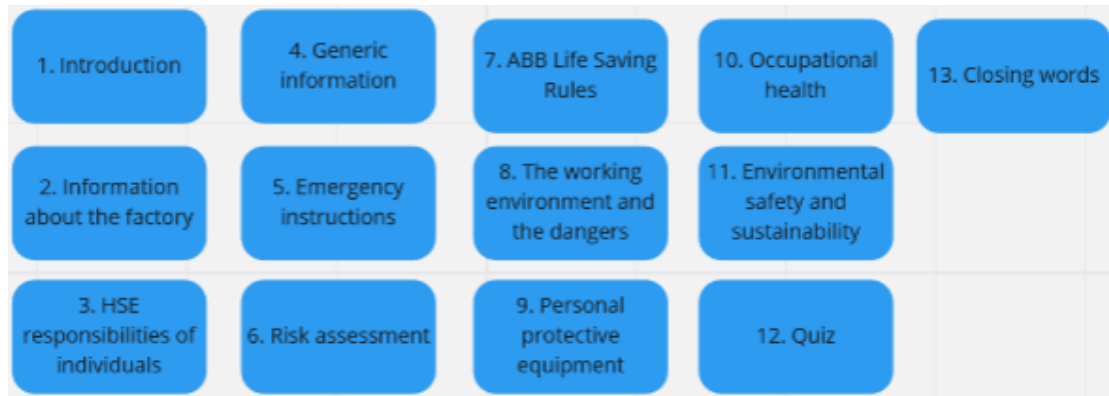


Figure 5 HSE induction training concept

an idea was generated after creating the concept. After the closing words, the training will offer the participant a button to finalize the training. After clicking the button, the program will send data to HR for registering the completion of the induction training for the participant. The program is yet to be coded, because it was not included in the thesis, but will be included in the final stages of creating the finalized induction training.

5 Conclusions

In this section, the purpose of the thesis is re-visited for the evaluation of the success rate of the thesis. The concept and the emerged problems will be reviewed alongside the usability of the HSE induction training concept as a product for ABB Oy. And lastly, self-assessment was done to self-evaluate the concept and the co-operation between the stakeholders and the researcher.

5.1 The finalized HSE induction training concept

The purpose of this thesis was to develop an HSE induction training concept for self-learning purposes for ABB Oy. The concept was developed to an extent where it could be possible to create induction training material internally within ABB Oy for the use of the HSE induction training in the future. The concept was not specific enough for external service providers to create the HSE induction training material, because the operations and practises are not familiar to external partner into an extent where the service provider could create detailed induction training material for ABB Oy. If the training materials were to be developed externally from a service provider, that would mean that ABB Oy Large Motors and Generators

Helsinki HSE team would have to create the training material to an extent where the service provider could finish the materials by only visualising and creating the final product for ABB Oy. This would mean extra costs for ABB Oy, more work, and more managing between stakeholders in the future when an update would be needed for the HSE induction training. The positive outcome of the delegation of responsibilities for the HSE team was that there already is some training material on inducting certain areas such as safe use of chemicals and environmental induction material readily available and for use, so the induction training material does not have to be created to each subject from the start but can be further developed or re-used for the purpose. The HSE induction training concept was also identified as a functional tool for the managers to induct a new employee to the organization if the HSE induction training concept is not developed to its original purpose in the future as a self-learning training.

5.2 The future of the HSE induction training

In the future, the creation of training materials will be the next step on the creation of the HSE induction training. The HSE team of Large Motors and Generators will ensure the training to be functional and to provide the best possible outcome for ABB Oy in inducting a new employee to the organization or an existing employee to a new department of the organization. The creation of the training material was excluded from the thesis because the thesis focused on developing an HSE induction training concept for self-learning purposes for ABB Oy to serve as a tool to help with the creation of the training material, and not on the creation of the induction training material.

5.3 Self-assessment

The goal of the thesis was reached by creating the HSE induction training concept to serve as a tool for different factories inside ABB Oy to induct a new employee or an existing employee moving from one department to another by self-learning through the training solution. The training concept can also be used as a tool for the managers to induct the employee, if necessary, but the main function of the concept is for the development of a self-learning training solution for ABB Oy. The implementation of the HSE induction training will take time and effort from the HSE team of ABB Oy Large Motors and Generators Helsinki and will not be readily available for use within a short time period. But at the meantime, the concept can be used as the main tool for the managers to induct employees until the training material is finished and the final HSE induction training is created.

While creating the concept for the HSE induction training, the data available for data analysis was easily accessible and the communication was mostly easy between different stakeholders such as ABB Oy Motors and Generators Vaasa, ABB Oy Drives Helsinki, and the occupational health experts in ABB Oy Large Motors and Generators Helsinki, but disruptions did occur

during the summer holidays. The stakeholders provided multiple documents regarding to their factory specific induction training materials and work specific materials. During the data analysis, the scheduling of the workshop and the creation of the agenda for the workshop were also done simultaneously to help with the time pressure and to manage the emerging disruptions of work from the summer holidays of experts and managers in ABB Oy.

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Appendix 1

INTERVIEW QUESTION

1. In your area of expertise, from a professional point of view. What would be the most important thing to induct for a new employee starting in the job?

Appendix 2

The Workshop questions

1. Can the same induction training serve the induction of a new office employee and a new production employee?
2. How generic the induction training must be?
3. The production facilities have identified high risk jobs. Do we emphasize the high-risk jobs in the induction training?
4. How are Life Saving Rules inducted in the training? Are we going for a in depth induction, or do we just explain the Life Saving Rules in a generic level?
5. Regarding to chemical safety, can we induct the safety data sheets and their locations in the production facilities?
 - 5.1 Where are the safety data sheets located in Vaasa and Drives? Are the procedures harmonized among locations?