KTH ROYAL INSTITUTE
OF TECHNOLOGY

Degree Project in Technology, Work and Health

Second cycle, 30 credits

Organizational Readiness for Initiating the Implementation of the RAMP Tool

A case study of LKAB Malmberget

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Photo: Daniel Olausson

Stockholm, Sweden 2023

TRITA – CBH-GRU-2023:270

Organizational Readiness for Initiating the Implementation of the RAMP Tool –

A case study of LKAB Malmberget

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Summary

In Sweden, all employers are obligated to provide occupational health services that prevent and eliminate health risks in the workplace. Risk assessment is one of the recommended procedures of systematic work environment management that employers shall conduct to investigate the occurrence of workplace risks. However, implementation of systematic risk management tools might be challenging for employers because it requires certain organizational preconditions such as enough OHS skills, resources, management commitment or a good workplace climate because these preconditions might facilitate or hinder the implementation. To support the implementation of risk management tools, the organizational readiness for change can be assessed. This master's thesis was written in collaboration with LKAB, the Swedish company operating in the mining industry. Specifically, the aim was to assess the organizational readiness of the worksite LKAB Malmberget for initiating the implementation of the RAMP risk assessment tool. The organizational readiness was evaluated based on the modified theoretical model which was created by combining existing theoretical concepts about organizational readiness for change together with the findings from the empirical pre-study conducted with two ergonomists who worked with the RAMP tool implementation in the Swedish company Scania. The research method was a case study, the data were collected by semi-structured interviews and analysed through directed qualitative content analysis. The evaluation resulted in the identification of facilitating and hindering aspects of organizational readiness. The organizational facilitating factors for RAMP tool implementation were identified as - sufficient organizational resources for work environment activities; high management commitment to improving work environment; good organizational climate for employees' participation in work environment routines; well-integrated technological system for risk reporting; and workers' positive experience with previously done work environment changes. The organizational hindering aspects for RAMP tool implementation were identified as - the prevalence of reactive approach in the systematic work environment management; lack of usage of standardized risk assessment tools, lack of OHS expertise in the execution of the work environment routines; ergonomics was not integrated into the work environment management; top management's tendency to support work environment interventions with clear benefits and timelines. Finally, the evaluation of organizational readiness resulted in the development of practical recommendations for the worksite which could be supported and initiated for the RAMP tool implementation.

Keywords: systematic work environment management, RAMP tool, organizational readiness, implementation of risk management tool

Sammanfattning

I Sverige ska alla arbetsgivare förebygga och eliminera hälsorisker på arbetsplatsen. Riskbedömning är en av de rekommenderade rutinerna av systematiskt arbetsmiljöarbetet som arbetsgivare ska genomföra för att utreda eventuella arbetsplatsrisker. Implementering av systematiska riskhanteringsverktyg kan vara utmanande för arbetsgivare eftersom det kräver vissa organisatoriska förutsättningar såsom tillräckligt med arbetsmiljökunskaper, resurser eller ledningsengagemang. Dessa förutsättningar kan underlätta eller hindra implementeringen. För att stödja implementeringen av riskhanteringsverktyg kan den organisatoriska förändringsberedskapen bedömas. Detta examensarbete skrevs i samarbete med LKAB, det svenska företaget inom gruvindustrin. Syftet var att utvärdera den organisatoriska beredskapen på arbetsplatsen LKAB Malmberget för att initiera implementeringen av riskbedömningsverktyget RAMP. Den organisatoriska beredskapen utvärderades utifrån den modifierade teoretiska modellen som skapades genom att kombinera befintliga teoretiska begrepp om organisatorisk förändringsberedskap tillsammans med den empiriska förstudien som genomförts med två ergonomer som arbetat med implementeringen av RAMP-verktyget i det svenska företaget Scania. Forskningsmetoden var en fallstudie, data samlades in genom semistrukturerade intervjuer och analyserades genom riktad kvalitativ innehållsanalys. Utvärderingen resulterade i identifiering av underlättande och hindrande aspekter av organisatorisk beredskap. De organisatoriska underlättande faktorerna för implementering av RAMP-verktyget identifierades som - tillräckliga organisatoriska resurser för arbetsmiljöaktiviteter; högt ledningsengagemang för att förbättra arbetsmiljön; bra organisationsklimat för medarbetarnas deltagande i arbetsmiljörutiner; välintegrerat tekniskt system för riskrapportering; och arbetarnas positiva erfarenhet av tidigare gjorda arbetsmiljöförändringar. De organisatoriska hindrande aspekterna för implementering av RAMP-verktyget identifierades som - reaktiv strategi i det systematiska arbetsmiljöarbetet; bristande användning av standardiserade riskbedömningsverktyg, bristande arbetsmiljökompetens vid genomförandet av arbetsmiljörutinerna; ergonomin var inte integrerad i arbetsmiljöarbetet; högsta ledningens tendens att stödja arbetsmiljöinsatser med tydliga fördelar och tidslinjer. Slutligen resulterade utvärderingen av organisatorisk beredskap i utvecklingen av praktiska rekommendationer för arbetsplatsen som kunde stödjas och initieras för implementeringen av RAMP-verktyget.

Nyckelord: systematiskt arbetsmiljöarbete, RAMP-verktyget, organisatorisk beredskap, implementering av riskhanteringsmetod

Acknowledgements

First and foremost, I would like to thank my partner Andrea for supporting me during my two years of studies. Without his care, support, and patience, I would not be able to study at KTH and complete my degree.

Secondly, I would like to thank my academic supervisors Linda and Liyun for giving me constructive feedback on my text and leading me through my writing process.

Finally, I also want to thank Jonna for her great engagement which made it possible for me to work on this project in collaboration with LKAB.

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List of acronyms and abbreviations

OHS	Occupational and Health Services
QEC	Quick Exposure Check
LKAB	Luossavaara-Kiirunavaara Aktiebolag
MSDs	Musculoskeletal Disorders
ORT	Organizational Readiness Tool
RAMP	Risk Assessment and Management Tool for Manual Handling Proactively
RULA	Rapid Upper-Limb Assessment
SWEA	Swedish Work Environment Authority
SWEM	Systematic Work Environment Management
TWH	Total Worker Health Programme
WEA	Work Environment Act

1 Introduction

In Sweden, the Swedish Work Environment Authority (Arbetsmiljöverket, 2001) provides recommendations on systematic work environment management for employers. The purpose of these recommendations is to help employers initiate a proactive approach in dealing with work environment measures such as securing employees' health or improving their productivity. However, some employers tend to develop practices of systematic work environment management reactively when problems in the work environment already exist, as reported by the survey conducted by the Swedish Work Environment Authority (Arbetsmiljöverket, 2013).

As shown by studies (Haslam, 2002; Rothmore et al., 2015; Weale et al., 2022), the success of the implementation of workplace interventions, such as new methods for MSD risk management or ergonomic advice in general, depends mostly on the organizational facilitators or barriers. For instance, management commitment; communication between management and workers; OHS skills; workplace culture; available resources and trust in the efficiency of a proposed intervention were named as significant contributors that can hinder or facilitate the implementation. Furthermore, the researchers propose that assessing organizational readiness for change can support the implementation of workplace interventions (Haslam, 2002; Rothmore et al., 2015; Weale et al., 2022). In this sense, assessing organizational readiness for change can be helpful for gaining accurate prediction of the probability of change success, and it can also help to identify weaknesses and barriers that can be intervened (Hannon et al., 2017).

This master's thesis is written in collaboration with the Swedish company LKAB, namely with its worksite in LKAB Malmberget. Specifically, the occupational health and safety strategist working at the company expressed interest in initiating the implementation of the RAMP tool - "a risk management assessment tool for manual handling proactively" (Lind et al., 2019, 2020; Rose et al., 2020) into the organizational work environment processes. The strategist's interest was reasoned by being able to evaluate the occupational risks of manual work and to start integrating better ergonomics into the organization's work environment routines. Moreover, the idea was that implementing the RAMP tool could encourage a more proactive approach to work environment management. Thus, the aim of this degree project is to assess the organizational readiness of the worksite LKAB Malmberget for initiating the implementation of an occupational health and safety program in which the RAMP risk assessment tool can be classified. The evaluation aims to identify strengths and weaknesses that could facilitate or hinder the implementation of the RAMP tool at the worksite. Moreover, the author of this thesis will identify recommendations that could the worksite execute to support the implementation of the RAMP tool in the future.

2 Research Objectives

This chapter specifies the aim of the study, research questions, research outcome and delimitations.

2.1 Aim

The aim of this degree project is to investigate the worksites' preconditions for integrating occupational risk management tool into work environment management. Specifically, the aim is to evaluate the organizational readiness of the LKAB Malmberget for initiating the implementation of the RAMP risk assessment tool. The intention is to identify potential facilitating and hindering aspects of organizational readiness for the implementation. And finally, to develop recommendations that could be followed by the worksite if it decides on the implementation of the tool.

2.2 Research Questions

What are the potential organizational strengths that may facilitate the RAMP tool implementation in the LKAB Malmberget?

What are the potential organizational weaknesses that may hinder the RAMP tool implementation in the LKAB Malmberget?

2.3 Research Outcome

The outcome of this degree project will be a set of recommendations that could be followed if the worksite decides to implement the RAMP tool.

2.4 Delimitations

This project is written in the context of one of the organization's worksites (Malmberget), while the other two sites (Kiruna and Svappavaara) were not included in the study.

3 Background

The background chapter begins with explaining the regulation of systematic work environment management that applies to all employers in Sweden, and the distinction between preventive and reactive approaches to work environment management. Then, there are presented concepts and research studies related to risk management and potential barriers and facilitators in implementing risk management tools. Moreover, the concepts of participatory ergonomics and stage of change are explained. Furthermore, there is a subchapter dedicated to the RAMP tool. Finally, the study context of the degree project is described followed by the subchapter about occupational risks in the mining industry.

3.1 Systematic Work Environment Management in Sweden

In Sweden, all employers are obligated to respect the Work Environment Act (Riksdagsförvaltningen, 1977) which states that employer must prevent their employees from occupational illnesses and accidents and establish a good work environment. According to the Act (section 2c), the employer is obligated to provide occupational health services whose purpose is to prevent and eliminate health risks in the workplace. Moreover, according to section 12, the employer is also responsible for informing employees about the existing risks in the work. Same as when using technical equipment at the workplace, the employer must ensure that employees are not exposed to risks of illnesses or accidents when using such equipment.

The Swedish Work Environment Authority (SWEA) is a public authority that is assigned by the Swedish government to control the law on the work environment that is pursued by companies and organizations. Thus, part of the SWEA's mission is to clarify and implement the Work Environment Act (WEA) through various provisions and regulations (Arbetsmiljöverket, 2020). As pointed out by Frick (2014), SWEA implements the WEA mainly in four steps: risk analyses, regulation of risks if necessary, providing information and guides on risks and regulations, and supervision of implementation. To do so, SWEA puts great importance on promoting voluntary compliance. For example, the provision on Systematic Work Environment Management (Arbetsmiljöverket, 2001) describes general recommendations for the implementation of the WEA that are relevant and obligated for all employers in Sweden.

As argued by researchers (Frick, 2014; Nordlöf et al., 2017), companies interpret and integrate the recommendations from SWEA differently, thus the application of mandatory occupational health management varies a lot among companies and organizations. This also confirmed the SWEA's survey (Arbetsmiljöverket, 2003) conducted among 350,000 employers in Sweden. The aim of the survey was to investigate how companies from different branches deal with systematic work

environment management (SWEM). According to the report, many employers and management had a lack of motivation to implement a systematic work environment management as a preventive approach to secure employees' health being or to improve employees' productivity. The most mentioned advocacy of many employers for dealing with systematic work environment practices was for reducing sick leaves and the rate of accidents, which corresponds with a reactive approach because it deals with problems that already occur (Arbetsmiljöverket, 2003).

A qualitative study (Nord Nilsson & Vänje, 2018) scrutinized the question of how occupational and health services (OHS) professionals can work in more preventive and proactive approaches rather than reactive ones. According to the study, preventive and systematic work environment management needs to involve line managers from an organization's different departments because the managers usually have a deeper understanding of a workplace and thus see the potential for integrating different practices. Furthermore, OHS professionals' participation from early stages in design and change processes, usage of risk assessment tools and good communication skills were indicated as successful preconditions. It was also argued that ergonomics should become an integrated part of company strategies rather than just a "time-limited" project.

3.2 Managing Risks

Aven (2016) explains that the risk field is about understanding the world and related risks in it, especially how one can understand, assess, and manage occurring risks in the world. The author divides two main tasks of the risk field. Firstly, one can study and treat the risks of specific activities by using risk assessments and risk management. Secondly, by performing generic risk research and development, one can relate to frameworks, methods, and models to understand, assess, communicate, and manage risks. The generic approach provides concepts and assessment tools to be applied to specific management problems.

Risk assessment is one of the recommended procedures of the SWEM provision (Arbetsmiljöverket, 2001) which states that employers shall conduct to investigate the occurrence of risks of ill health and accidents in the existing working conditions. In terms of ergonomics, the Swedish work environment authority obligates employers to control and investigate how their employees perform work to prevent musculoskeletal disorders (Arbetsmiljöverket, 2012). Specifically, a risk assessment shall be conducted to assess loads' duration, frequency, and intensity of work postures, working movements, manual handling, and repetitive work. Physical, organizational, and psychosocial factors of the work environment should be also assessed. This provision (Arbetsmiljöverket, 2012) contains instructions on how to assess these factors in a workplace even though the guidance is rather general.

3.3 Barriers and Facilitators in Implementing MSD Risk Management

Implementation of the systematic risk management processes might be difficult. As argued by Weale et al. (2022), most barriers and facilitators for implementing MSD risk management happen on an organizational level (organizational mechanisms, processes, policies). The researchers (Weale et al., 2022) identified barriers such as lack of management commitment, poor communication between management and workers, lack of OHS skills, lack of resources, workplace culture or productivity demands. The same items were also recognized as organizational facilitators such as management commitment, business structures that allow the intervention to be integrated with existing OHS management, realizing benefits that arise after the intervention and productivity gains.

Furthermore, the researchers argue that barriers and facilitators on an individual level impact the success of implementing MSD risk management. Individual barriers were identified as worker attitudes and behaviours. Individual facilitators were identified including workers' demographic characteristics (level of education), the role of incentives for workers to participate in interventions, and organizational requirements for workers to implement MSD risk management. This means that implementing MSD risk management tools requires a comprehensive approach generated on an organizational level and followed on an individual level (Weale et al., 2022). For example, if an organization creates a requirement to adopt a risk-management method, the organization should provide training or support to employees to learn about the method.

The researchers (Weale et al., 2022) concluded that when using tools for managing MSD risks, one must consider the context where the tool will be applied same as well as tailor its usage to the context of the organisation. The authors confirmed that the organizational readiness for change is decisive in supporting the implementation of MSD preventive strategies.

3.4 Participatory Ergonomics

Participatory ergonomics is based on involving workers in developing and implementing workplace changes with the aim of reducing health and safety risks and improving productivity in a workplace. According to Burgess-Limerick (2018), this approach considers that if workers get suitable tools, knowledge, resources, and encouragement, they can act as experts who successfully identify and analyse workplace problems and implement effective solutions. A participatory program usually involves one or more teams who are brought together to improve the design of work, reduce musculoskeletal injuries or improve the organizational climate (Burgess-Limerick, 2018).

Research evidence suggests that participatory ergonomics programs have a positive effect on reducing musculoskeletal disorders (MSDs). A study by Cantley et al. (2014) referred to the benefits of participatory ergonomics in connection to the systematic approach to ergonomic risk control. The authors did a quantitative study investigating data from 123 jobs at 17 manufacturing plants where overall more than 300 ergonomic risks were reported. Cantley et al. (2014) compared workplaces which implemented a systematic identification of ergonomic hazards using risk assessment tools (e.g., NIOSH Lifting Equation, RULA and QEC) with workplaces which did not adopt any type of risk assessment tools over the ergonomic risks. The workplaces that controlled ergonomic hazards using risk assessment tools were much more successful in reducing MSDs and the risk of injuries among their employees in comparison with the workplaces that did not apply any type of tool for risk identification (Cantley et al., 2014).

3.5 Stage of Change Model

Implementation of ergonomics advice might be hindered by a client/company disinterest due to the cost of intervention or distrust that the proposed intervention will be ineffective (Rothmore et al., 2015). Same as when ergonomist consultants propose workplace changes, they might have little influence over the process of implementing the changes. As illustrated by Rothmore et al. (2015), there exist methods associated with behaviour change principles that can be applied to improve the implementation and effectiveness of ergonomics advice in the context of a workplace. The model called the stage of change is one of these methods (Rothmore et al., 2015). According to the model, recipients should seek interventions depending on their stage (Haslam, 2002). As described by Rothmore et al (2015, pp. 371), in the context of the workplace, the stage of change assesses readiness for change through a series of closed questions that are assigned to one of five stages. Ergonomic advice is then adjusted according to the stage of change to improve receptiveness.

Five stages of the model:

1) *pre-contemplation* (workplace risks are not considered at all)
2) *contemplation* (change in a workplace is considered but not ready to act)
3) *preparation* (there is an intention to start with a change in the near future)
4) *action* (a change was done in the previous half a year)
5) *maintenance* (support of made changes to keep up its benefits)

3.6 RAMP - Risk Management Assessment Tool for Manual Handling Proactively

In this study, RAMP was the chosen risk management tool based on the mutual agreement between the author and the contact person (occupational health and safety strategist) from the collaborative organization (LKAB Malmberget). The motivation for choosing the RAMP was done based on the proposed needs - to start systematically evaluating manual working tasks, and thus strive to integrate better ergonomics into the work environment routines. Even though LKAB Malmberget is known mostly for underground mines, it has several worksites supporting the entire mining process where workers must work manually. Moreover, the occupational risks occurring in the mining industry are particularly explained in the study context (in subheading 3.7).

RAMP is a risk assessment tool based on observational screening of factors related to musculoskeletal disorders in a workplace, there exist two models RAMP I and RAMP II. The tool is designed for the assessment of working tasks performed by manual handling in diverse industries. The RAMP tool was developed in collaboration between researchers and industrial practitioners with the vision to provide a comprehensive and easy-to-use method that can support the management of MSD risks in a systematic way. The development of the tool was done using an iterative and participative methodology with a strong emphasis on testing the usability and reliability of the tool, and it covers a larger number of risk factors in comparison with other tools (Rose et al., 2020).

RAMP I functions like a checklist for identifying potential MSD risks, while RAMP II is meant to analyse the recognized risks more deeply. It is recommended to conduct a risk assessment using both versions, starting with RAMP I and then investigating further with RAMP II (Rose et al., 2020). In the RAMP tool, the assessment is divided into these exposure categories: postures, work movements and repetitive work, lifting work, pushing, and pulling work, influencing factors, reports on physically strenuous work, and perceived physical discomfort (Lind et al., 2019, 2020). Both versions of RAMP contain the results and actions module. The results module helps to facilitate the communication of results with different stakeholders and can be used as a decision-based tool. Based on the results, the actions module suggests concrete examples of actions that can be taken to support systematic risk management strategies. Overall, using the RAMP tool creates for companies a good opportunity to integrate a systematic approach that can improve the work environment (Rose et al., 2020).

Linhardt (2015) studied the process of RAMP tool implementation in the Swedish company Scania. Scania was one of the industrial companies which was collaborating on the development of the tool with the researchers. Linhardt's study was performed during the time when the RAMP tool development was not fully finished. Thus, she described the first phase of the RAMP implementation which consisted of four pilot studies that were conducted at Scania's logistics and machining departments to test

the tool. Linhardt's report mapped the pilot studies and evaluated the processes that worked or did not work during the implementation in the organization.

3.7 Study Context

This project is written in collaboration with LKAB, a Swedish company operating in the mining industry. LKAB is a producer of iron ore, minerals and special products. In Sweden, the company has three underground mines located in Kiruna, Malmberget and Svappavaara, and it also operates worldwide. Overall, with its 4 500 employees LKAB is the biggest employer in the North of Sweden (LKAB, 2023). Specifically, the project was conducted for the LKAB's worksite in Malmberget, and the project's topic was initiated by the mutual agreement between the author and the health and safety strategist from the company. The proposed needs of the contact person were named as to start with an assessment of manual work, strive for better ergonomics of work and thus try to encourage a more proactive approach in systematic work environment management.

3.8 Occupational Risks in the Mining Industry

According to Donoghue (2004), the mining industry is a heavy industry characterized by many occupational hazards. Considering the physical work environment, noise is prevalent since is generated during various working tasks such as drilling, blasting, material handling, ventilation, and iron ore processing. Heat and humidity are also typical to occur in underground mines, where the temperature increases with depth due to the geothermal gradient and auto-compression of the air column. Workers can be exposed to whole-body vibration while operating with types of equipment such as load-haul-dump units, trucks, scrapers, and diggers. Hand-arm vibration is also a common exposure because workers are often using vibrating tools. In addition, chemical hazards are significant in mining. For example, exposure to crystalline silica or coal dust increases the risk of lung diseases (Donoghue, 2004).

Even though the working tasks in mining are highly automatized, many working tasks are still done manually thus is relevant to also consider the ergonomic risks (McPhee, 2004). One must keep in mind that around the mine exists different facilities that support the processes of production, material processing or transportation. For example, the working tasks of mechanicians, electricians or warehouse personnel contain a lot of work with hands above shoulders, heavy loads lifting, and movements in unfavourable postures. Furthermore, McPhee (2004) refers to the ergonomic risk of irregular heavy work combined with sedentary work and its effect on musculoskeletal systems. As argued by (McPhee, 2004), the mining industry puts the highest priority on accident prevention, while the OHS approach still needs to be better integrated. He

proposes that risk management and participative ergonomics are the most important parts of OHS to be implemented in mining.

The Swedish Work Environment Authority (SWEA) published a provision (AFS 2010:1) about the work environment regulations and their application in the mining industry. Meanwhile, the SWEA also provides guidance through its other provisions on physical work environment factors that can occur in mining such as noise, gas, chemical risks, dust, or work in an explosive environment. Considering the ergonomics in mining, SWEA refers employers to follow the provision on ergonomics for the prevention of musculoskeletal disorders (Arbetsmiljöverket, 2012).

4 Pre-study: The processes of the RAMP tool Implementation in Scania

The only found scientific report specifically about the RAMP tool implementation was by Linhardt (2015) who described the RAMP tool pilot studies in the Swedish company Scania. Linhardt's study brought evidence about the first phase of the implementation at Scania and did not follow the implementation towards the end (Linhardt 2015). At Scania was the RAMP tool implemented into the systematic work environment management and has been widely applied as a risk assessment method for manual working tasks across the entire organization (AFA Försäkring, 2018).

For this project, it was desired to investigate more information about the processes of implementation of the RAMP tool in Scania, and to learn about the most significant aspects that successfully contributed to the implementation. Thus, I conducted a pre-study including a semi-structured interview with two ergonomists who worked with the development and implementation of RAMP at Scania. My purpose was to get information about the professionals' experience from the phase before and during the RAMP implementation, and to get to know their recommendations to an organization that is interested in implementing the tool.

The interview lasted 45 minutes, was conducted in Swedish using the Teams platform and was recorded on an iPhone application. Afterwards, I transcribed the interview using the software Go Transcribe. The important information from the interview was translated into English and divided into three parts:

1) Processes before the RAMP implementation in Scania
2) Processes during the RAMP implementation in Scania
3) Recommendations to an organization for the RAMP implementation

4.1 Processes Before the RAMP Implementation in Scania

According to the interviewed ergonomists, the implementation of the RAMP tool was closely connected with Scania's systematic work environment management (SWEM), which was very well established within the organizational structure and this fact helped to start with the RAMP tool. One of the functions of SWEM was that all working sites had a work environment coordinator for dealing with work environment issues and an ergonomics coordinator who coordinated ergonomics at the work department. Later, the role of ergonomics coordinators was important during the RAMP implementation as they were collecting and structuring results from the RAMP assessments. In terms of the SWEM, the organization had also an established structure for dealing with work environment issues in relation to quality and productivity.

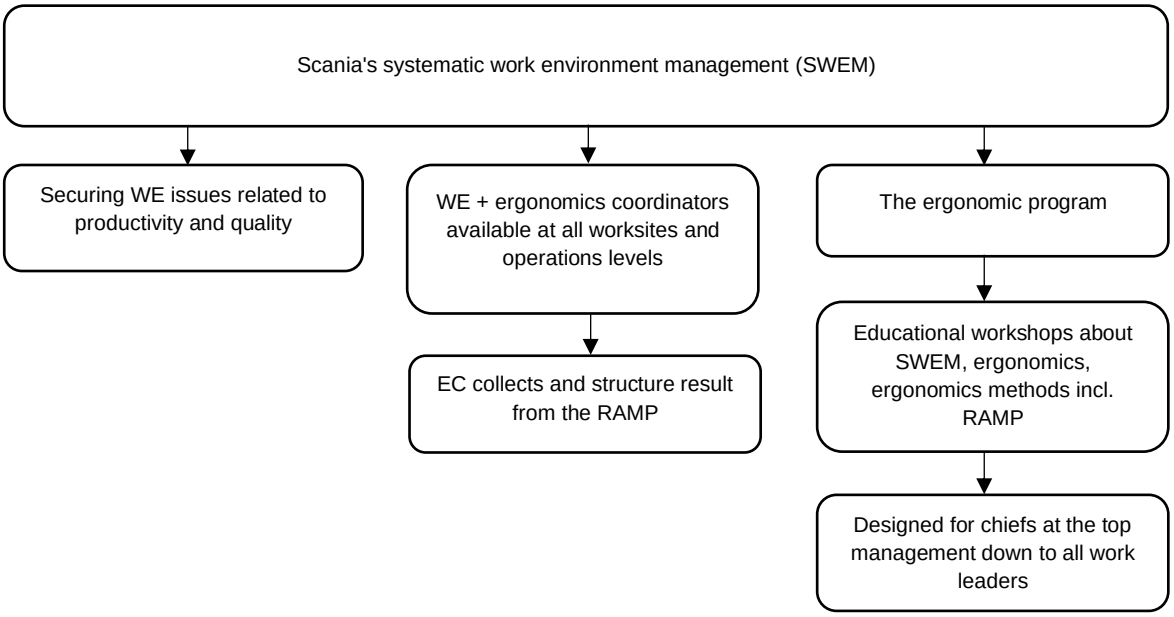

Figure 1: Functions of Scania's systematic work environment management related to the RAMP tool implementation

Furthermore, the organization established its own internal process within the SWEM focused only on ergonomics (the ergonomic program), this program was introduced simultaneously with the implementation of the RAMP tool. The ergonomic program included educational workshops regarding pillars of systematic work environment management such as resources that are needed for successful work with SWEM and overreaching presentations about ergonomics including presentations about different ergonomics methods. All the chefs on the top management level down to the work leaders participated in these workshops. The ergonomic program required long preparation efforts and to have enough resources to train and educate the employees. It was significant to get the resources and to organize well how to work with them. There was a delegated person for the evaluation, prioritizing, and decision-making who was responsible for the activities in the ergonomic program.

The important fact is that there was approval from the organization's top management regarding the RAMP tool, that it should be a risk assessment method incorporated into all operations within the logistics and processing departments. Thanks to the approval, many resources were available for the employees' internal training in the RAMP tool. Also, another organization's strategy was to create a standard for ergonomic method (Scania has an internal department for standards) and label the RAMP tool with it. A part of the standard was the development of an internal manual of the RAMP tool. The standardization gave a certain weight to the tool, especially from the top management's perception, and it allowed to establish a standardized way for its usage within the organization.

4.2 Processes During the RAMP Implementation in Scania

The interviewed ergonomists mentioned that during the implementation of RAMP, an internal project group was established to train the worksite employees who were then supposed to become RAMP assessors. At the same time, there was developed the internal manual for the RAMP tool which used during the training sessions. During the training sessions were available ergonomists together with the project leaders to educate the management and other employees on different levels about the RAMP tool. Around 10 - 15 ergonomists were available at the working sites, working closely with the site workers. So, in case there was needed to have an expert for assessment, there was an ergonomist ready to support them. The training session was 20 hours long, and a large part of the training was filming the working tasks and then practising and assessing with RAMP 1 and 2 under supervision. For example, an assessment was done in pairs (a workshop technician together with an operator), they filmed the working tasks, watched the video together and assessed, plus they had an ergonomist nearby who could help and support them. In case, there was already known that there is a worksite with heavy manual work, they evaluated working tasks directly with the RAMP 2. Also, they were flexible with the RAMP, for example, lifting was assessed by another existing assessment method labelled by the organizational standard.

The RAMP assessors (site employees) had one day a week to work on the assessments, usually starting immediately after they completed the training. According to the ergonomists, the critical moment was that it could take a long time until the employees started to assess with RAMP and then it was difficult for them to start. On the other hand, it happened that some employees who got trained never started to assess.

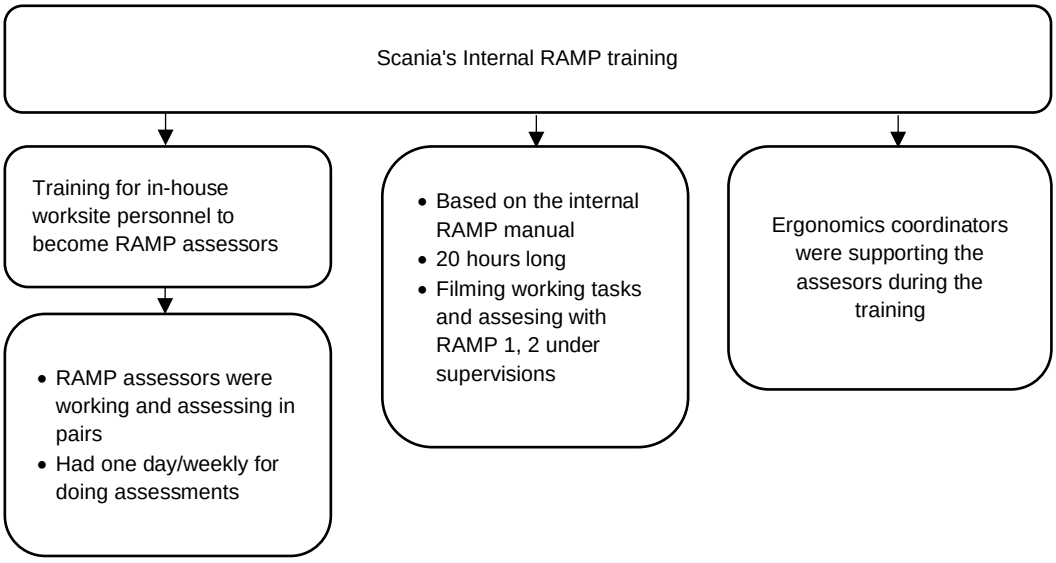

Figure 2: Description of the internal RAMP education developed for training sessions of RAMP tool assessors at Scania

4.3 Recommendations to an Organization Interested in the RAMP Implementation

The interviewed ergonomists would advise to an organization that wants to implement RAMP the following. Before the implementation begins, one can consider how an organization works with quality deviations, work environment improvements, and how are ergonomics aspects integrated into work environment management.

According to the ergonomists' experience, it is important to anchor with the management that working with the RAMP requires having enough time and personnel resources. For example, an organization should delegate personnel that will directly work with the tool, will become trained and will have a good knowledge about the method. The ergonomists recommended planning ahead how much work will be needed to do.

The ergonomists highlighted the need to involve the whole line from top management, and middle management to frontline workers. They mentioned especially letting the management understand the benefits of the RAMP and prepared them that resources will be required. Organizational top management should follow up the implementation same as middle management. According to the ergonomists, middle management can be significantly important for taking measures after doing assessments.

They also recommended having internal educational training about the tool and anchoring the training with organizational management. There should be provided enough time to let do employees the training and give them time to work with the tool during their working hours. Similarly, becoming an experienced assessor requires that one can work with the tool regularly. And to work regularly, one should get enough support while learning the tool.

According to the interviewed ergonomists, an organization should think about how will proceed with results after assessments are done because they did not recommend just doing an assessment without taking any measures. It is advisable to try to work on the structure - how can be dealt with measures and how could employees work with improvements in groups. Employees' participation is very important when it comes to doing assessments because employees have a good knowledge of what they work with. Then employees' participation can be also helpful when working with proposals for improvements and measures and evaluating them.

Finally, the ergonomists advised to start with the RAMP in a small defined group - to test the method, evaluate, refine the systematic approach, and get started. After a good structure for working with the tool is built, an organization can work more with the RAMP.

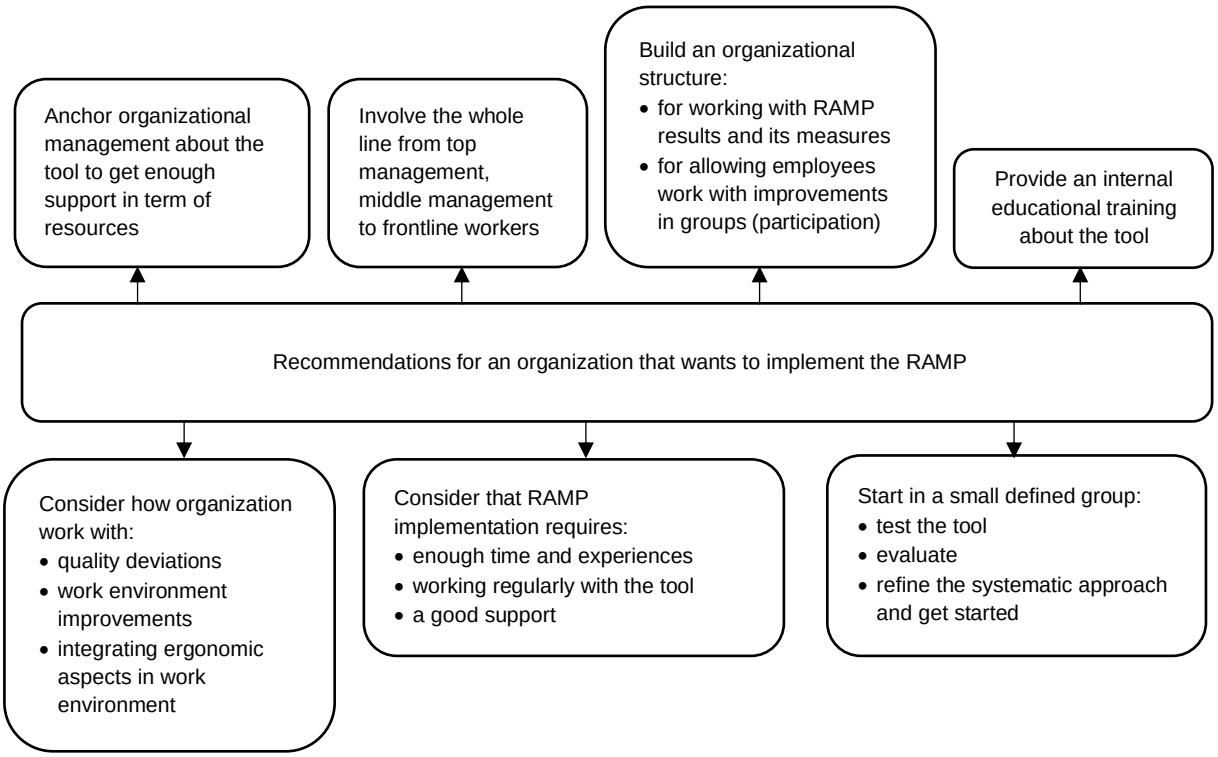

Figure 3: Recommendations of the ergonomists from Scania interviewed in the pre-study

5 Theory

This chapter presents the theoretical concept of organizational readiness for change including viewpoints on how this concept can be assessed.

5.1 Organizational Readiness for Change

Organizational readiness for change is a theoretical concept of change management that has been widely applied mainly in the context of the health science (Cunningham et al., 2002; Lehman et al., 2002; Shea et al., 2014). Organizational readiness for change is considered a key determinant for the successful implementation of a change or a program in an organization. When the organizational readiness is insufficient, the intervention will be unsuccessful and most likely will fail. Assessing or measuring organizational readiness can be helpful for gaining accurate prediction of the probability of change success, eventually, it can also help to identify weaknesses and barriers that can be then supported (Hannon et al., 2017).

One of the most cited definitions is Weiner's definition which interprets organizational readiness as "*a shared psychological state in which organizational members feel committed to implementing an organizational change and have confidence in their collective abilities to do so"* (Weiner, 2009, p.6). Organizational readiness for change is considered a multi-level and multi-faceted construct. Multi-level means that readiness is present among individuals, groups, departments, and organizational levels. Multi-faceted means that it depends on members of an organization and their own level of change commitment (a shared resolution among organizational members to implement a change) and level of change efficacy (a shared belief among organizational members value the proposed change). Change commitment and change efficacy are influenced by change valence (which refers to how much organizational members value the proposed change) and informational assessment (organizational members' perceptions of the task demands and resources required to implement the change). Organizational readiness is situational, and it is difficult to generate it, some organizational attributes create a more receptive context for a change. Change valence and informational assessment are foreseen by contextual factors such as previous organizational experience with change, organizational resources and structures. Change efficacy and change commitment estimate the change-related efforts that are coordinated by organizational members to implement the change (Weiner, 2009).

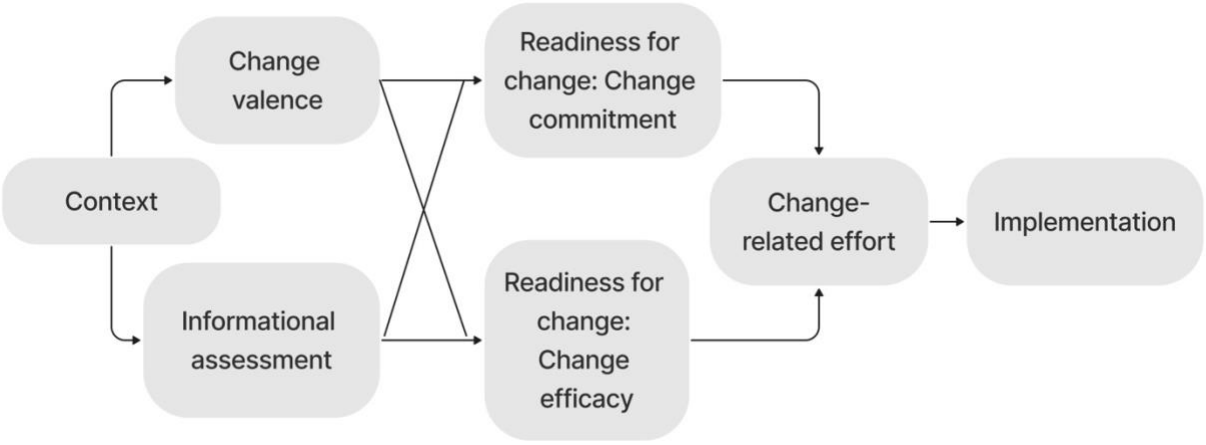

Figure 4: Theory of organizational readiness for change (adapted after Hannon et al., 2017, p. 68)

5.2 Different Levels of Organizational Readiness for Change

Vakola (2013) mentions that organizational readiness to change is a broad construct that reflects a number of factors. Studies often don't differentiate between individual and organizational readiness to change which leads to conceptual confusion. Thus, Vakola (2013) distinguishes the readiness using a macro (organizational), meso (group) and micro (individual) level of analysis.

Individual readiness to change refers to recipients' willingness to support the proposed organizational change/programme. The change won't occur if employees are not ready for it. The positive attributes that contribute to a high level of individual readiness can be open to change, self-esteem, self-efficacy, and positive affectivity. These attributes are formed by contextual situations such as high or low trust, high or low organizational commitment, and opportunities to participate in planning the implementation or perceived impact of the change. For example, it can be useful to assess the individual readiness to change of those involved or affected by the change. The outcome of individual readiness to change will result in supportive or non-supportive behaviour to change (Vakola, 2013).

Group readiness to change refers to the following collective understanding and beliefs - the change is needed; the organization has the ability to handle the change adequately; the group will profit from change outcomes; and the group has the competency to cope with the change requirements. Vakola (2013) mentions that individual readiness should be explored together with group readiness because individual characteristics impact positively or negatively the groups. Thus, she proposes that a higher level of group readiness is affected by a greater proportion of members with high individual readiness to change. At the same time, group readiness can influence individuals' beliefs and behaviours, especially in the sense of shaping norms that impact individuals' perceptions of the change. More favourable group norms to support the change will positively strengthen individual readiness to change.

Considering the organizational level of readiness, Vakola (2013) mentions that this level refers to the existing organizational mechanisms, processes and policies that can motivate or hinder change (such as organizational culture, climate or leadership commitment). Furthermore, she argues that the macro level can be positively influenced by high micro (individual) and meso (group) levels of readiness. Since a successful implementation of change depends on the fact that an organization reaches a certain degree of organizational readiness, it should be considered and enhance all three levels of readiness, so that the change can be incorporated on macro, meso and micro levels. Vakola (2013) specifies this as follows: at the macro level, readiness should be integrated into the strategic plan and emphasise building a trustful environment to form positive attitudes towards organizational change. At the meso level, should be created a feasible change plan on the organization's specific requirements, moreover, efforts should be directed towards the creation and fostering of change-supportive group norms. At the micro level, readiness can be identified and developed through the training of personnel and development programs.

5.3 Assessing Organizational Readiness for Change

According to Weiner (2009) when assessing organizational readiness, one should identify a set of actions that must be organised and executed to achieve effective implementation of an organizational change. Generally, during the assessment, one should attempt to answer the following questions:

- Do organizational members know what is required to implement the change effectively?
- Do organizational members have the resources to implement the change effectively?
- Can organizational members implement the change effectively in facing the current situation?

Weiner (2009) also advices on steps that support the effective implementation of the change:

- developing an adequate strategy for implementing the change
- involving people in implementing the change
- ensuring that implementation goes smoothly through tasks coordination
- preventing problems that could arise during the implementation
- managing the politics of implementing the change

A readiness assessment can be done through observation, interviews or surveys by focusing on questions about organizational strengths and weaknesses, employee expectations and attitudes. One of the common methods for readiness assessment is a climate survey (Vakola, 2013). The climate survey items mostly differ and depend on the context of the study and the planned change. In the previous studies (Cunningham et al., 2002; Hannon et al., 2017; Robertson et al., 2021), the authors created their own

tools for assessing organizational readiness based on defining various specific items that were relevant to investigate in the context of the studies.

5.3.1 Assessment in the Context of Workplace Intervention

In their study (Robertson et al., 2021) a conceptual framework and model were created with the aim to develop an organizational readiness survey regarding implementing an occupational health and safety program. The study is specifically related to the NIOSH programme called Total Worker Health (TWH) which is a workplace programme that integrates work-related safety and health protection. The authors identified factors that are linked with organizational readiness for change and implementation of an occupational safety and health program in the workplace. Their aim was to design a diagnostic tool based on a survey that could help organizations to assess their level of organizational readiness for change when initiating, managing and sustaining a method or program related to workplace intervention (Robertson et al., 2021).

The developed model is called the Organizational Readiness Tool (ORT) for change and is based on a survey that is built on eight domains of organizational readiness and each of these domains contains different questions. The information provided through the survey shows which domains are stronger or weaker and can help an organization identify strengths and areas for improvement to build capacity and readiness to implement a workplace intervention (Robertson et al., 2021). ORT aims to investigate information regarding different organizational aspects and not directly the psychological state of members who could influence an organizational change as does Weiner's model.

Table 1: The eight domains of the organizational readiness tool for change (Robertson et al., 2021, p. 1325 - 1328)

Domain	*The purpose of domains' evaluation in ORT for change*
1	current programs to promote employees safety, health and well-being
2	current approaches to safety, health and well-being in an organization
3	resources available for safety, health, and well-being
4	resources and readiness for change initiatives to improve safety, health and well-being
5	resources and readiness for use of teams
6	team work in "your" work group
7	resources and readiness for employee participation
8	management communication about safety, health and well-being

5.3.2 Modified Theoretical Model for Assessing Organizational Readiness for Implementation of MSD Risk Management Tool

To the author's knowledge, there has not been found any study assessing organizational readiness for the implementation of MSD risk management tool in a workplace. Therefore, for the research purpose of this project, the author modified a theoretical model that tailors organizational readiness for change specifically the topic-related subject - MSD risk management tool which the RAMP tool is.

The model was derived by combining the existing theoretical concepts of organizational readiness for change (Hannon et al., 2017; Robertson et al., 2021; Vakola, 2013; Weiner, 2009) with the findings from the pre-study. More specifically, the domains of ORT for change (Robertson et al., 2021) were adjusted by its purpose of evaluation, new categories were assigned to the domains same as its subcategories were defined. This re-definition of the domains (purpose of evaluation, description of its categories and subcategories) was done based on the findings from the pre-study.

It resulted in the creation of the theoretical model for the evaluation of organizational readiness for initiating the implementation of MSD risk management tool (see Table 2). When comparing the modified model with the ORT for change (Robertson et al., 2021), the author made the following changes:

- *The original 1 & 2 domains* were *substituted by the new domains 1 - 3* (current approaches to systematic work environment management; ergonomics; and risk management). The purpose of these domains is to evaluate existing organizational processes related to the steering of the work environment.
- *The original domain 3* in ORT *is presented as the new domain 4*, it considers resources available for work environment activities such as time, economic resources, education & training, and possibilities for problem-solving in case of lack of knowledge.
- *The original domain 4 is presented as the new domain 5* named resources and readiness for change initiatives related to work environment. It considers previous experience with change commitment and change-related efforts.
- *The original domains 5 & 6 were not developed* in the new model because they evaluate the use of team and workgroup. These domains were considered unnecessary to evaluate at this the stage of project when is unknown whether the LKAB will really initiate the change (the implementation of the RAMP tool).
- *The new domain 6* evaluates readiness for employee participation, it considers how are employees usually involved in developing and implementing work environment activities.
- *The original domain 8 is presented as the new domain 7* and it similarly considers the management communication about WE routines and practices.

Table 2: The modified theoretical model for evaluation of organizational readiness for initiating the implementation of MSD risk assessment tool

New number of domains	New purpose of the domain's evaluation	Created categories of the domain	Created subcategories of the domain's categories
1	Current approaches to systematic work environment management (SWEM)	Existing processes in the SWEM in the organization	Activities or routines that are part of SWEM
		Employees' perception regarding SWEM	Perception of how the organization strives for a good work environment
			Perception of challenges in steering the SWEM
			Suggestions on improvements of the SWEM
2	Current approaches to ergonomics	Existing ergonomic activities in the organization	Activities or routines in ergonomics (eventually solutions of erg. risks)
			Evaluation of ergonomic risks
		Employees' knowledge of ergonomics	Professional knowledge regarding ergonomics
			Perception of ergonomics
		Perceived ergonomic risks	Ergonomics risks
3	Current approaches to risk management	Risk management processes	Activities or routines in risk management
			Risk Assessment
			System in reporting WE risk
			Routines in dealing with reported WE risks
			Consideration of workplace risks and quality/production flaws
		Employees' knowledge of workplace risk identification	Experience in risk identification/risk assessment

New number of domains	New purpose of the domain's evaluation	Created categories of the domain	Created subcategories of the domain's categories
4	Resources available for work environment activities	Economical resources for work environment activities	Employees' perception of available economical resources for dealing with WE agenda
			Employees' perception of management's willingness to invest in WE improvements
		Time resources for work environment activities	Employees' perception of available time resources for dealing with WE agenda
		Education and training regarding WE	Employees' perception of management's willingness to let employees learn
			Existing education & training
		Employees' problem solving	Employees' activities with WE problems in case of lack of knowledge
5	Resources and Readiness for change initiatives related to work environment	Previous experience with change efforts related to WE	Employees' associations of situations that were initiated for WE change
		Employees' perception of WE change related efforts	Perception of management prioritization of supporting new and better ways in steering WE
6	Resources and Readiness for employee' participation in work environment activities	Employees' perception regarding WE participation	Experience about actions on reported WE risks or problems
			Perception of management commitment to enhance employees' suggestions on WE
			Employees' motivation to learn new activities/programs in WE
		Employees' existing participation	Participation in existing routines
7	Management communication about WE routines and practices	Communication between workers and management	Employees' perception of management communication about WE activities

6 Methods

The empirical part of this project was conducted as qualitative research. Qualitative research attempts to understand, describe or explain social phenomena and the meanings that people bring to them (Flick, 2007). In terms of epistemology, this research project adopted the interpretivist perspective which believes that the social world is constructed and interpreted by people, and aims to understand how the participants construct the world around them in a social setting (Williamson & Bow, 2002).

The research approach adopted in this study was deductive. Deduction in qualitative research often means that data are analysed according to an existing theoretical framework which allows the adoption of theory as an analytical lens when collecting and analysing data (Flick, 2018). The deductive approach is recommended when the inquiry of the study is theory-driven and targets specific experiences, phenomena, and actions about which is a researcher certain that will appear in the empirical materials (Saldaña, 2021).

6.1 Research method

The research method of this study was a single case study. When using tools for MSD risk management, one should consider the context where the tool will be applied (Weale et al., 2022). A case study is a research method that can be applied in different situations, such as when researching individual, group, organizational or social-related phenomena. It is a suitable research method when understanding context is important such as the experience of individuals or the context of actions. Case studies are usually based on qualitative data collection, sometimes combined with quantitative data (Williamson & Bow, 2002).

According to Yin (2018), a case study "investigates a contemporary phenomenon (the case) in depth and within its real-world context when boundaries between phenomenon and context may not be clearly evident" (Yin, 2018, p. 15). A case study's strength is the ability to deal with a variety of data evidence such as documents, interviews, observations or artefacts, and is considered an appropriate method when the research question is formulated about "how" or "why" regarding a contemporary set of events that a researcher has little or no control (Yin, 2009). The challenge with the case study method can be that a researcher must identify her or his case and decide whether one or more cases should be studied. At the same time, a researcher will need to set boundaries in terms of time, events or processes that are adequate for studying his or her case (Creswell, 2007).

In this project, choosing case study as the research method was driven by the fact that the case was clearly identified at the early stage of the project and the aim of the project was to provide a deep understanding of this case.

6.2 Research Design

Research design illustrates the logical sequence that connects empirical data to a study's initial research questions, and eventually to its conclusions. In other words, research design outlines what questions to study, what data are relevant, what data to collect, and how to analyse the results (Yin, 2018).

According to Yin (2018, pp. 27), the research design of a case study contains five components:

- case study's questions
- study proposition
- defining the case
- linking data to propositions
- criteria for interpreting the findings

In this project, the research process was conducted iteratively meaning that it was not followed exactly as Yin (2018) explained.

The *definition of the case* (the organizational site - LKAB Malmberget) was known at the early stages of the project same as the topic while the aim and research questions were still undefined.

The study began with a one-week visit to the worksite in February 2023. Before the visit, the organization's documents such as internal guidelines regarding work environment processes were reviewed, and the information was complemented by personal communication with the contact person. After the visit, the work took place on the study propositions.

In the *study propositions stage*, an extensive literature study was conducted to write the background and the theoretical part. At the same time, started the process of defining the aim, research questions and scope of the study. The aim and research questions were mostly modified based on the literature study. During the literature study was found only one scientific report about the RAMP implementation. Thus, the author conducted a pre-study to investigate more information about the important aspects that can hinder or facilitate the RAMP tool implementation in an organization. The pre-study consisted of one semi-structured interview with two ergonomists who worked with the RAMP implementation in the Swedish company Scania. The findings from the pre-study were applied for modification of the theoretical model, specifically for the redefinition of domains, their purposes of evaluation, categories, and subcategories. The theoretical model modification was done with the intention to tailor

the concept of organizational readiness for change to the topic-related subject - MSD risk management tool which the RAMP is. Later in the study, the theoretical model was applied to *link data to the propositions* and to *develop criteria for interpreting the findings*.

The major source of data collection were semi-structured interviews in this study. The interview guides (Appendix 1 A-E) were prepared using the modified theoretical model altogether with the LKAB's internal documentation about the descriptions of the work positions (Table 3 shows the overview of professional roles). The data were analysed and interpreted through a directed qualitative content analysis using the subcategories and categories of the modified theoretical model. Finally, the findings were organized according to the domains of the theoretical model.

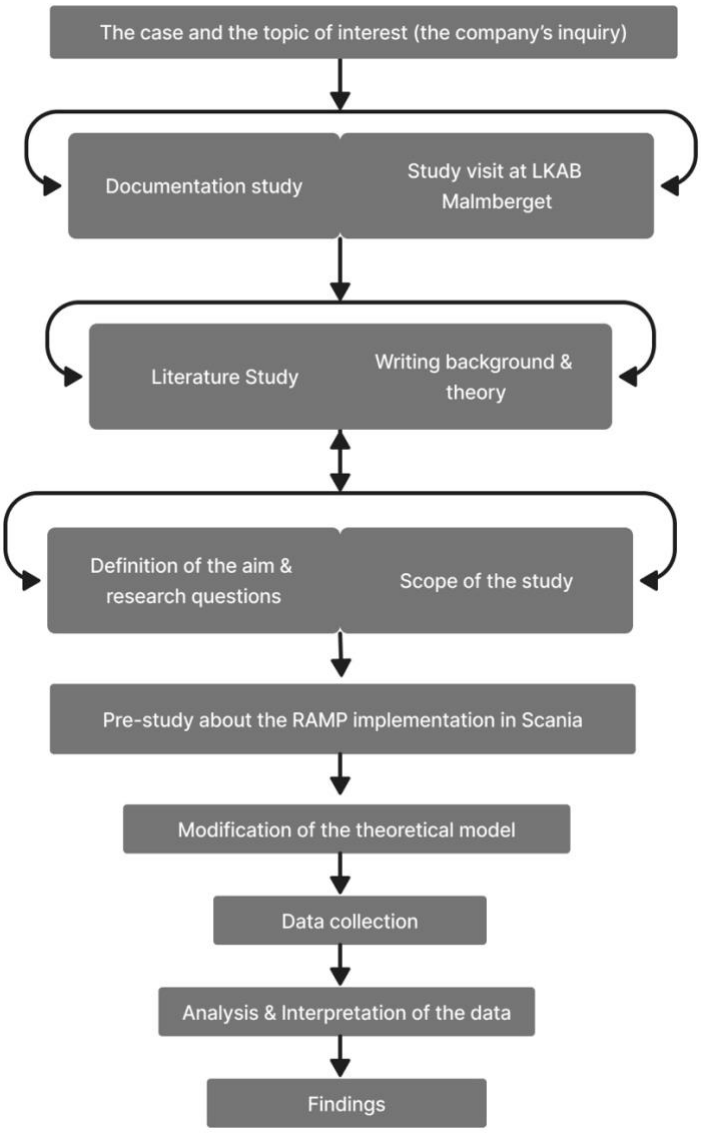

Figure 5: Applied steps of the research design in the study

6.3 Data collection

6.3.1 Documentation

According to Yin (2018), documentary information is likely to be relevant to every case study topic. Studying documents might help to find new questions about communications and networking within an organization. Documents can be helpful in verifying evidence from other resources such as correct titles and names of people and organizations that might be mentioned in an interview. Simultaneously, systematic searches for relevant documents are important for data collection and fieldwork. The weaknesses of documentation are seen in retrievability (can be difficult to find), biased selectivity or in getting access to it (Yin, 2018).

In this project, the documentation such as the internal guidelines and reports from the LKAB's external OHS provider were collected before the visit to the worksite. The aim was to get an overview of the LKAB's organizational structure and existing activities and routines in the work environment agenda. Later, the internal descriptions of work positions were provided for the preparation of interview guides for semi-structured interviews. The studied documentation was usually complemented by personal email and verbal communication with the contact person. Figure 6 illustrates the usage of documentation in the research study.

The access to the documentation was through the contact person who usually provided a type of document requested by the author which means that the author did not have direct access to the organization's internal documentation. The given information was confidential thus its content is not detailed presented in the thesis.

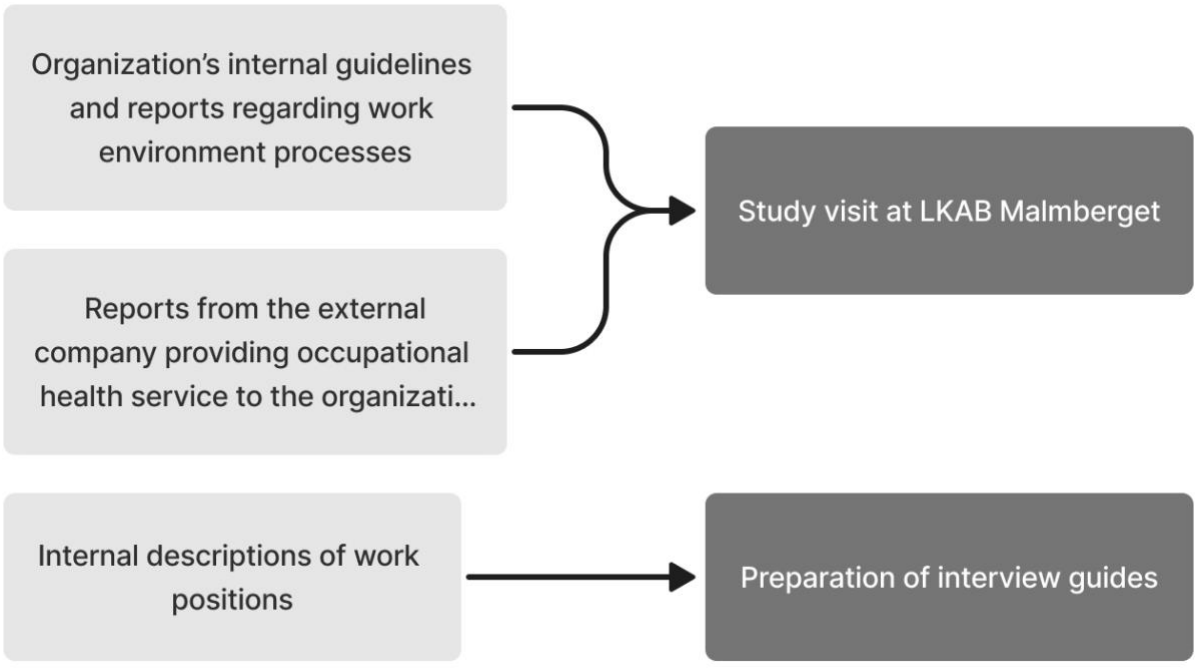

Figure 6: The usage of documentation in the research study

6.3.2 Semi-Structured Interviews

Yin (2018) argues that interviews are one of the most important sources of evidence in a case study. Interviews are effective for getting information directly about the case study topic, interviews can provide insightful explanations and personal views (perceptions, attitudes, meanings). On the other hand, the weaknesses of interviews can be biased due to poorly articulated questions, and inaccuracies due to poor recall or reflexivity (the interviewee says what the interviewer wants to hear).

In this project, 13 semi-structured interviews were conducted, from which one interview was done with a representative from the external company providing OHS services to the LKAB group, and the 12 interviews were with the employees working in LKAB Malmberget. The research participants were chosen in cooperation with the contact person. Altogether 12 participants working at the LKAB Malmberget site agreed to be interviewed. They were working in different positions from upper and middle management to first-line workers, and across different organizational departments. The overview of the research participants is presented below (in Table 3). The interviews lasted in the range of 19 to 51 minutes and were conducted in Swedish. Most of the interviews were conducted digitally via the Teams platform, and one interview was conducted live in Stockholm. The interviews were recorded on an iPhone application.

Table 3: Overview of the research participant

Interview guide used	IG1	IG2	IG3	IG4	IG5
Number of participants interviewed	4	2	4	2	1
Professional Role	Section Chief Occupational Health and Safety Strategist	QEHS coordinator (quality, environment, health, and safety)	Section manager Worksite Manager	Frontline Worker/Safety representative	Physiotherapist from the external OHS company

The interview guides contained questions related to the domains (themes) from the modified theoretical model (see Table 2), the questions for each domain were formulated depending on the professional role of the interviewers. The descriptions of

the job positions of the interviewees were considered during the preparation of the interview guides using the internal organizational documentation. Finally, there were created altogether five interview guides (see Appendix 1 A-E).

6.4 Research ethics

All research participants were first contacted via email with a request to participate in the study. If they agreed to be interviewed, the consent form was sent to the participants (see Appendix 2). Before each interview started, every participant was again informed about their rights such as that the participation was anonymous and voluntary, they had the possibility to stop the interview anytime, and they did not need to answer all the asked questions. The researcher also informed every participant when the interview started to be recorded and stopped being recorded on the iPhone.

6.5 Data Analysis

The method for data analysis was a directed qualitative content analysis which is a deductive approach (Hsieh & Shannon, 2005). A deductive approach is recommended when conceptual frameworks, research questions or other matters of the research design suggest that certain categories, themes or concepts are most likely to appear in the collected data (Saldaña, 2021). Assarroudi et. al (2018) describe steps that can be followed in directed content analysis. In this project, the following steps corresponding to Assarroudi et al. (2018) were taken:

- *Development of formative categorisation matrix* - corresponds to the phase of the modification of the theoretical model when the purposes of domains' evaluation were re-defined, and for each domain were specified categories and subcategories (see Table 2).

- *Development of interview guides* with questions related to the domains (themes), their categories which were relevant to the professional role of an interviewee.

- *Conducting interviews and verbatim transcription* of the interviews - the transcription was done using the software Go Transcribe.

- *Immersion in data* - each transcribed interview was listened to again and corrected manually because the software did not create flawless text, the final version of the transcription took up 81 pages.

- *Performing the data analysis* - Since the interview guides included questions related to the domains (themes), in the first step of data analysis were reviewed all the interview transcriptions and information related to the domains were highlighted. This was done to organize the data. In the second step of data analysis, the highlighted content was reviewed again using the subcategories and thereafter the categories which resulted in indicating the codes.

- *The abstraction of categories from codes* - The codes were grouped and categorised according to their meanings, similarities, and differences.

- *The establishment of links between categories and themes* - are detailed presented and described in the chapter findings.

7 Findings

The findings are presented according to the domains from the modified theoretical model (see Table 2). Domain 1 (current approaches to SWEM) and domain 3 (current approaches to risk management) are linked in the findings because the analysis showed that these were connected. The findings are illustrated by the participants' quotes which were translated into English from the original transcription. A summary of the findings is at the end of this chapter.

7.1 The Current Approaches to the Systematic Work Environment Management

The steering of a systematic work environment management (SWEM) is at the organization (LKAB Malmberget) closely connected to safety and risk management. The organization has internal checklists for routines such as risk assessments or safety rounds, the checklists are developed based on the work environment legislation but can be also internally adjusted. The main responsibility of executing the routines is up to worksite managers who generally use the checklists as a guide through the routines. The participants described that it is challenging to set up "the right level of knowledge" for activities within the systematic work environment management across all the different worksites, same as to control the quality of activities and routines executed based on the checklists. On the other hand, the checklists help to facilitate activities that should be done within the SWEM.

> *"To work with systematic work environment work, there we have a large organization that works with checklists to try to measure and keep track of that all workplaces are doing what they should in order to be proactive so that you have risk assessments in place. That we work with norms at the workplace. That we do safety rounds. That we act on the deviations that we actually receive. To work with risk assessments, risk analyzes and so on. But we also see that it is very important to have a genuine safety culture so that we have a safety culture group in Malmberget."* [Interview - Section Chief]

> *"We have discovered that a point* (in checklist) *like this can mean different things to different managers and then we have thought that we have to develop this a little more and direct the governance around.* (...) *It's about knowledge because if you have enough knowledge to be able to perform, so you get a good, well-founded analysis of the work environment. And it is a challenge in all different areas to find the right level that works in the workplace."* [Interview - Occupational Health and Safety Strategist]

7.1.1 Activities and Routines within Risk Management

The organization puts a strong emphasis on "safety first" and this approach forms the activities within their risk management. The organization prioritizes reporting of work environment risks, which in practice means that workers on all levels are encouraged to report a certain number of risks per year. And the "safety first" approach also mirrors the character of reported risks. The existing routines in risk reporting were often associated with a reactive approach because they prioritize and deal with issues that already exist and prevent them only with short-time measures.

> *"Specifically work environment risks, the managers are constantly trying to encourage the employees to submit more risks...But I think most of it is from accidents, so when you can get hurt, those kinds of risks. It is not always, for example, heavy work moments that there are such risks as well, but the biggest part are accident risks that you see. (...) We now put a lot of focus on the reactive, the same as on the follow-up and look at accidents and look at incidents and those numbers. We have not yet come to look at how many risk assessments we have done or what risks we have remedied. "* [Interview - QEHS coordinator]

> *"Our priority so far is reactive, that is, when something happens, we collect it with quite a lot of force, we investigate and try to come up with measures to prevent it from happening again. That we are good at, I think."* [Interview - Occupational Health and Safety Strategist]

The organization has its internal technological system for risk reporting, where are risks divided into three categories - risks, incidents, and accidents. All the employees have access to the system, so they can report risks directly. The system has functions which analyse reported risks based on the probability impact analysis. Overall, dealing with the reported risks was perceived positively, it was mentioned that reported risks are taken seriously the same as actions are taken against the risks. The responsibility to act against reported risks is again up to worksite managers.

> *"We have a system where we report risks, incidents and accidents, where we encourage all employees to write down even the simplest things...Before this year, we set a requirement that all employees should report one risk per quartal. So it will be like all employees filling four risks per one year and now we see that the curves have gone straight up. The advantage is that they are forced to thinking with risk awareness (....) What we always do is to have a discussion with the person who submitted the risk so that it is understood and then we create action proposals. And then there will be feedback when it has been fixed a certain thing. "* [Interview - Worksite Manager]

> *"We have our XX system and it is available both on computers and on the phone. So every employee has that system on their phone. So if you discover something, you can immediately report it, take a picture and all the information instead of writing on a piece of paper. You fill directly."* [Interview - Frontline Worker/Safety representative]

Risk assessments are another key part of the LKAB's risk management routines. The participants mentioned that the criteria of risk assessments are based on internal know-how and designed to indicate risks. This means that the criteria for the risk assessments are not really standardized and the lack of standardized methods was perceived as the reason for not being able to conduct a "good assessment". Due to the shortage of standardization, there exist several types of risk assessments within the organization, and the responsibility for conducting risk assessments is up to worksite managers who can eventually ask for support from QHES personnel.

> *"I have seen for several years that we need to have more methods to assess precisely different factors. It doesn't matter to say, there is a risk yes or no. But if it exists then - How? How extensive is it? What severity? What do we need to do about it? There need to be methods, I think, to have it easier. (...) We lack precisely these methods to make good risk assessments. We have a basis in the risk assessment template, but it does not help to make a good assessment."* [Interview - Occupational Health and Safety Strategist]

> *"What I can think is that sometimes, if we have gone through a risk assessment for two or three years, we think it looks the same. Then it is easy to become home blind. So really, I could imagine throwing away an old risk assessment and starting from scratch instead of taking an old one as a template."* [Interview - Worksite Manager]

> *"Risk assessments are an area that is challenging to do well and it is probably quite a lot of the activities we do. The way we do risk assessments differs in the organization. And we put a lot of responsibility on the managers, it depends a lot on the managers to learn this and be able to do these assessments independently and together with their employees."* [Interview - Section Chief]

Considering the production and quality flaws, these are not regularly analysed in relation to reported work environment risks. However, the participants were aware that a good work environment impacts positively productivity and quality.

> *"The only follow-up we have is a number that the management looks at. They don't look at what kinds of quality deviations there are. They just check a number and that's it. It is like no follow-up on the content of the risks."* [Interview - Occupational Health and Safety Strategist]

> *"How well we are doing in terms of production is very closely related to our work environment work. We have always seen those trends go hand in hand. When production is bad, we have a worse working environment, statistics and vice versa."* [Interview - Section Chief]

7.2 The Current Approach to Ergonomics

Ergonomics of the work environment was associated in relation to the fact that workers usually search for help when they get injured or have pain. In that case, workers use the service of a physiotherapist or chiropractor offered by the external OHS company. Furthermore, supporting better ergonomics in the workplace had the participants often associated with purchasing advanced models of working equipment and machines.

> *"If someone has an occupational injury. There are never any problems. I only book XX* (the external OHS company)*, and then we have like a company doctor who checks on us and knows about that ergonomic stuff and stuff like that."* [Interview - Worksite Manager]

> *"A lot of machines. Now that we got an electronic machine and they are much kinder to the body because they don't break so there is no sand spraying everywhere, that was a real work environment problem before."* [Interview - Frontline Worker/Safety Representative]

> *"Yes, we buy a lot of equipment and we replaced later. At the time when I was working on the floor many years ago...back then there were big, heavy, vibrating machines rather than the lighter and more ergonomic ones. We try to buy most of them so that one does not get injured in daily work."* [Interview - Worksite Manager]

The participants' understanding of ergonomics indicates that the approach to ergonomics is reactive in the organization, generally, in-depth risk assessments of manual working moments are not conducted. Eventually, the routine is to assess working tasks through the internal probability and impact analysis which can indicate risks but does not offer a complex analysis. Moreover, there are no working ergonomists in-house in the organization. Workers have the possibility to consult ergonomics of work with the external OHS company, but this type of service is not really used.

> *"But it is the general, the overall risk and impact analysis, so it may come up that we would have to do something because there will be a risk for musculoskeletal disorders. But that says very little. More crushing injuries or cuts and things like that becoming immediately and not over a long time period."* [Interview - Frontline Worker/Safety Representative]

> *"I know that we have the opportunity to take help from XX* (the external OHS company)*, that we can take with us to risk assessments and we can take to inspect the workplace....But I would probably say that we don't have that much knowledge about ergonomics in particular. For example, heavy lifting, repetitive work, twisting and lifting at the same time, and different work movements. We would need to map the work movements we have and make an assessment of them. But, I don't think we've gotten that far in our risk assessments yet."* [Interview - Occupational Health and Safety Strategist]

> *"We haven't worked very much with ergonomics for prevention of musculoskeletal disorders. Before we had medical occupational care built into the company, but*

today we don't have that. We have XX (the external OHS company) *which we use for help. I don't think we use XX to the same extent that we had our ergonomists or physical therapists, our own, doing assessments. We may not always think of using it..."* [Interview - Occupational Health and Safety Strategist]

However, the participants were aware that some work groups are encountering ergonomic problems, such as musculoskeletal disorders. The reasoning of the problems was usually because the work is hard, the work area is too broad, or people were working for many years at a workplace.

"The problems of XX (a certain workgroup) *are often not immediate, because things have happened over a long period of time. XX* (the workgroup) *often have problems with their shoulders and neck because they work a lot above their heads. But it doesn't hurt in the same crank you lift, but you only get it after a long time, so maybe nobody reacts right away. Our job is hard. We have tried to find some aids for when we pull our cables on discs and it is often that you cannot access with the lifting aid we have close enough, but then you have to lift cables and wear a little and we can't find any other solutions that work. It is difficult. But the biggest problems are the neck and shoulders."* [Interview - Frontline Worker/Safety Representative]

"The staff who work such as XX or XY underground. They have a huge area with lots of different equipment that must be maintained. So that it is clear, I think. And from an ergonomist's point of view, it is like a big challenge to standardize it because your work area is so broad. (...) Some staff have musculoskeletal disorders because historically have worked for a long time at LKAB and they worked with manual tasks before, had some problems and then needed to change to work in office." [Interview - Section Chief]

7.3 Resources for Work Environment Activities

Generally, the participants' perception of available financial and time resources for activities within the work environment agenda was very positive. It was obvious that the organization provides enough financial resources for buying work equipments and aids. Moreover, the participants thought that there is enough time for dealing with various issues within the work environment.

"I think that LKAB works quite well for a good work environment for their employees and makes sure that they have all the equipment they need, clothing and protective equipment everything you need... There is a lot we can buy in everything - you need lifting aids so it is not a problem, and they (LKAB) promote health and exercises have gyms and everything that promotes human health as well." [Interview - Worksite Manager]

"Clearly. I can't say anything. I do not know a manager who had said that something has to go quickly, that you can skip and do it in an unsafe way. Everyone wants you to do it safely or not do it at all." [Interview - Frontline Worker/Safety Representative]

Additionally, the participants expressed that in a case when workers do not have enough knowledge to solve some work environment problems, they can ask for support within the organization. The organization has sufficient in-house resources, such as skilled personnel. And eventually, one can always ask for help from the external OHS provider.

> *"In total* (the entire LKAB)*, I think we have about fifteen KMA and work environment coordinators in the company, both as work environment developers and work environment coordinators. After all, we have quite many resources that work with work environment issues and support the worksites with that. So in this way, I think that the company prioritizes work environment in that way."* [Interview - Occupational Health and Safety Strategist]

> *"We try to find out and see how it can be fixed* (work environment issue)*, and regardless of whether they are really hard or soft issues, help is needed. There are, as we say, in-house in the company a lot of resources to draw on and if that doesn't help, there is the possibility of taking help from external resources, so to speak."* [Interview - QEHS coordinator]

Furthermore, the participants expressed that the organization regularly provides educational and training courses on various topics about the work environment. However, the participants showed ambivalent perceptions regarding the possibility of taking the courses. Worksite managers have unlimited options to take courses, while for frontline workers it depends on permission from their immediate managers.

> *"There are lots of courses to attend. Then also one can request that needs more information or training for example in noise and they can get it. It's like unlimited training for the staff, if the staff wants to go on training, they get it."* [Interview - Occupational Health and Safety Strategist]

> *"I think they can be a bit fussy on some courses but it depends a bit on who is your manager. My boss says I should go to this training for the work environment, just take it... But I don't know how it is for someone who is not a safety representative if they would like to do something. It is up to the immediate boss and our boss thinks that if you are committed and want to learn something, then you should learn because the worst thing you can do is kill a commitment."* [Interview - Frontline Worker/Safety Representative]

7.4 Resources and Readiness for Change Initiatives Related to the Work Environment

The participants expressed mostly positive experiences when they were describing concrete examples of previously initiated changes related to the work environment. Some of the described situations underlined how the entire organization accumulated knowledge across its different departments and worksites to find solutions for work environment issues.

> *"Last time we had something like the QEHS collaboration forum, appeared a proposal about a question about lifting blocks and we came to the conclusion that that was unclear. There were ambiguities around this. A working group was then appointed with representatives from staff, a representative from Malmberget, a representative from Kiruna and also from technology, methods and technology. Now they are working on developing a proposal for training course in lifting blocks."* [Interview - QEHS coordinator]

> *"(...) one model of cable we worked a lot above the head and it was very heavy and very slow to work with, so we took it up as a work environment thing. Does this cable have to be this bad, can't you get a better one? Then we got in contact with the supplier and they had to come to us. We showed how we work. We said we need to get a better model of the cable. So they for almost two years, worked on different mixtures of the rubber and stuff, so then developed one that works much better, then we produced it and there will be a new EU standard on it the cable. And is like funny thing that you as the staff feel that we have helped to influence so that it becomes better for all electricians throughout Europe."* [Interview - Worksite Manager]

However, the perception of top management's prioritization for work environment improvements was described in the sense that the top management usually prefers to support solutions that can bring obvious benefits and have a clear timeline. But in the case when it's unsure how long an intervention takes and if it will bring benefits, it might be difficult to convince the management that it's the right to do.

> *"I think so if it is perceived as easy, if it is easy to do it or if they* (the management) *feel that the organization will see the benefit of it fairly quickly. This particular work that we do is time-consuming and takes a lot of our energy as well. Time is booked up and it is more difficult to get it prioritized sometimes in the organization because you have a lot of urgent matters that happen and you have different ones. (...) I think it's about being able to justify with numbers and say that we have this much occupational disease. Or this is how we can do it, solve it long-term and it is always more difficult to see long-term results with preventive work. After all, we don't know what would have happened if we hadn't done the things that we work on preventively. You don't always see immediate results, so it can be. It can be more difficult to sell work that does not produce direct results."* [Interview - Occupational Health and Safety Strategist]

7.5 Resources and Readiness for Employees' Participation in Work Environment Activities

The employees' participation in work environment improvements was generally related to the risk management routines that exist in the organization. For instance, employees usually share their suggestions for improvements when they report risks in the internal system or when they participate in risk assessments. According to the participants' experience, their suggestions are taken seriously and considered by their managers, but sometimes it takes too long time until the problems to be solved.

> *"I go through my risk assessments with QEHS coordinator and then I bring our annual review and then it's safety representatives of those who work on it. Yes, the staff themselves are involved in doing it, I don't do it myself, because I am not the one who works with it. It is very difficult for me to assess a work myself. But I worked in a workshop, so I know. But the staff is always with the assessments and safety representatives."* [Interview - Worksite Manager]

> *"(...) but always if we've come up with something and talked to them, it almost always has. Yes, we have been heard for our suggestions and such mostly (...) I think, as I said, that we are always heard when it is brought up. But it usually happens sometimes that it takes so long before certain parts are solved if there is a problem. But as I said, we almost always listen in, can go and talk to them and it is taken up at the meeting and proposals for what to do and how to do it."* [Interview - Frontline Worker/Safety Representative]

7.6 Management Communication about Work Environment Activities and Routines

According to the participants, the management communicates about the work environment agenda often and regularly, which made them think that the organization highly prioritizes the work environment. Communication usually happens in various planned meetings but also during regular workdays. In the organization are established workgroups that participate in work environment meetings.

> *"At least twice per quarter, we sit down and talk for a longer period of time about work environment issues and all issues that affect the workplace. Then every workplace has weekly meetings and they have workplace meetings. And I would say that at almost all meetings there is an item that deals with the working environment. All of our meetings that we have throughout the LKAB Group begin with point one, safety first."* [Interview - Section Chief]

> *"They* (the managers) *have a monthly meeting every single month and there they address all the risks that have actually been written in their area of work responsibility. And I think they do so because they seem to be very aware of all the risks that are written and he* (the manager) *also addresses risks that they have been on. But we also have a monthly meeting with us employees or groups at the workplace so they can bring it up. So I think it is handled really well."* [Interview - Frontline Worker/Safety Representative]

7.7 Summary of the Findings

The research participants related the organizational systematic work environment management to the routines and activities within safety and risk management. These routines and activities were executed by worksite managers based on the internal checklists. The challenge of steering activities within the SWEM was seen in the setting right level of knowledge across all the organization's workites and controlling the quality of executed activities. It was mentioned that the production and quality flaws were not routinely analysed in relation to the reported work environment risks. These findings show that the organizational structure of systematic work environment management may not be consistently established and that the execution of the SWEM may lack expertise.

The analysis showed that the organization prioritized "safety first" which shaped the routines of risk management such as risk reporting and risk assessments. The participants reported that the risk assessments were created on internally designed criteria (like the checklists) and not on standardized methods. Risks were usually reported reactively when already had happened and this shows that the organization may not have knowhow to work with standardized risk assessment methods. On the contrary, the findings showed that the organization had a well-established internal technological system for risk reporting which was accessible to workers via multiple platforms.

The participants' understanding of ergonomics indicated that the organizational's approach towards ergonomics of the work environment might be reactive. For example, ergonomic problems were solved when workers already suffered from pain and ergonomic risks of manual work were not assessed. Moreover, it was mentioned that in the organization was not working in-house ergonomics. This implies that the organization may not have enough expertise in ergonomics, and that ergonomics aspects of work are not integrated into the work environment management.

On the contrary, the participants perceived that the organization supports better ergonomics by purchasing new machines and working equipments. It confirmed that the organization provided enough financial resources for work environment improvements. Regarding the other organizational resources such as enough time for dealing with the work environment agenda or access to professional support, if needed, these were perceived by the participants as very adequate. Moreover, the participants reported that the organization invested in the personnel's knowledge of the work environment by providing them with educational training and courses. These findings indicate that the organization may provide sufficient resources for work environment interventions.

According to the participants, the management communication about work environment activities was perceived as regular and adequate. It was reported regular meetings about the work environment agenda were organized. This indicates that the

organizational management may highly prioritize the work environment agenda. On the other hand, the research participants expressed that the top management' tend to prioritize work environment improvements which had only clear benefits and set timelines. This finding indicates that the organizational top management may not be willing to invest in the interventions with uncertain assets.

Finally, the analysis showed that employees' participation in work environment activities was closely connected with the risk management routines. The participants expressed that their suggestions for work environment improvements were considered seriously by their managers, and they felt heard. Similarly, the participants' experience with previously initiated changes related to the work environment was very positive, and it demonstrated that the organizational climate sufficiently allowed employees to accumulate knowledge across different departments. These findings demonstrate that the organizational setting may be sufficiently engaging employees to participate in the work environment agenda.

8 Discussion

The study results showed that the steering of work environment management in the organization was characterized by the risk and safety management routines that were executed through internal checklists, internal risk assessments and safety rounds. It resonates with the argument of Frick (2014) & Nordlöf et al. (2017) who argue that companies interpret and integrate the recommendations of the Swedish Work Environment Authority differently, thus the application of mandatory occupational health management varies among organizations.

The findings pointed out that the organization prioritized "safety-first" which confirms what others previously found (McPhee, 2004) that in the mining industry, the highest priority is on accident prevention. The "safety-first" approach formed risk management routines especially risk reporting in the organization and was noted that in most cases the risks were reported reactively when already occurred. Moreover, the risk assessments were routinely conducted based on the internally defined steps and checklists which indicated the deficiency of using standardized risk assessment tools. The shortage of standardized risk assessment tools is a sign of the reactive way when dealing with the work environment (McPhee, 2004; Nord Nilsson & Vänje, 2018).

Furthermore, the findings pointed out that the major responsibility of executing the routines within the work environment management was up to the worksite managers, who eventually decided if they needed to seek help from in-house and external OHS professionals. However, the interviewed occupational health and safety strategists mentioned that the worksite managers barely asked for help from the external OHS company when conducting risk assessments. The lack of involvement of the OHS professionals is another aspect that can contribute to the reactive approach (McPhee, 2004; Nord Nilsson & Vänje, 2018).

On the contrary, the existing involvement of worksite managers and frontline workers in the risk management routines is a sign of participation. The organization had a well-established system for risk identification that was accessible on different platforms and employees were actively using it. Also, the results showed that the workers' suggestions for work environment improvements were usually considered by their managers, and the managers found it beneficial to involve the workers in risk assessments because they had a good knowledge of the workplace. Participation is one of the preconditions that help to integrate the proactive approach to systematic work environment management (Nord Nilsson & Vänje, 2018).

On the other hand, the findings indicated that participatory ergonomics programs were not really developed in the organization. The current ergonomic practices were characterized as a "time-limited project" (purchasing new machines), reactive (occupational injuries and musculoskeletal disorders cured by physiotherapy) and the professional knowledge regarding ergonomics was bound (no in-house ergonomists).

It clearly revealed that ergonomics had not been an integrated part of the organizational strategies (Nord Nilsson & Vänje, 2018), which also corresponds with the lack of standardized tools for the identification of ergonomic risks (Cantley et al., 2014) that could help to prevent employees from occupational injuries. Thus, this is another aspect that hinders the organization from managing proactively the work environment (Nord Nilsson & Vänje, 2018). Additionally, the lack of standardized risk management tools indicates a reasonable opportunity for the organization to implement the RAMP tool in the future.

The findings demonstrated that the research participants had sufficient resources for the work environment agenda including financial and time resources, the opportunity to ask for support from in-house and external OHS specialists, and the possibility for worksite managers to take various educational training related to the work environment. At the same time, their perception of previously initiated changes in the work environment was very positive. Moreover, it was reported that the management prioritized the work environment agenda and communicated regularly about it. These organizational aspects (sufficient resources, positive experience with previous change, management commitment) are recognized as facilitators for implementing standardized risk management tools (Weale et al., 2022). Although, regarding the management commitment and their prioritization of work environment improvements it was reported that solutions with clear benefits and timelines were generally preferred. Thus, this could become a barrier when implementing MSDs risk management tools because it might be difficult to prove the benefits of the prevention of MSDs, especially within a limited timeline (Weale et al., 2022).

This study assessed organizational readiness for initiating the implementation of the RAMP tool at LKAB Malmberget by using the modified theoretical model with relevant items to the context of the study. The model applied in this study was created by the redefinition of domains of the ORT for change (Robertson et al., 2021), some of the current domains were not included in the evaluation (for example, the use of team and workgroup). The re-definitions of the domains, their categories and subcategories were created based on the findings from the pre-study. In this sense, the study followed a similar logic as the studies (Cunningham et al., 2002; Hannon et al., 2017; Robertson et al., 2021) where the authors developed their own tools for assessing organizational readiness based on the studied context.

Considering the research method applied in this study, the evaluation of organizational readiness was conducted as a qualitative single case study focusing on the identification of the organizational strengths and barriers that may facilitate or hinder the RAMP implementation. The major source of data collection was semi-structured interviews with a limited number of participants. Additionally, the documentation was used before the study visit of the organization and for the preparation of the interview guides. The documentation was not directly used for the evaluation of organizational

readiness due to the time limits of this project. However, for some of the domains (for example, resources available for work environment activities) it could be desired to do. Moreover, applying the qualitative method in assessing organizational readiness differentiated from the ORT for change (Robertson et al., 2021) which is designed to be a survey. The qualitative method in this study was chosen with the purpose of understanding the context through individuals' experiences, and thus the study results did not position whether the organization is ready or not for the RAMP tool implementation.

The identified organizational strengths and barriers that may facilitate or hinder the RAMP tool implementation at LKAB Malmberget are summarized in Table 4. The table also contains explanations on how these factors may hinder or facilitate the implementation, the explanations were reasoned based on the findings of the pre-study (see the chapter 4). Apparently, the findings can support the organization in creating a strategic plan and specific requirements to foster the implementation of the RAMP tool (Vakola, 2013). In this sense, the study differs the Weiner's concept of organizational readiness for change (2009) because the findings brought evidence about the contextual factors for the potential change while the individual commitment of the organizational members to the change was not investigated.

Table 4: The identified strengths and barriers for initiating the RAMP tool implementation at LKAB Malmberget

The identified strengths	How may facilitate the RAMP implementation?
Sufficient resources for the work environment agenda	– Enough time and resources to invest in internal educational training about RAMP – Possibility to hire professionals who can support the implementation – Time to let employees work with the tool regularly – Good facilities to work with the tool – Enough financial resources to invest in actions
High management commitment for improving work environment	Anchoring the management about the tool in terms of resources and benefits that will contribute to proactive risk management
Good organizational climate for employees' participation in work environment routines	Involvement of employees on different levels in doing assessments, based on results encourage them to propose improvements and actions
Well-integrated technological system for risk reporting	– Employees are used to report work environment risks – Technological support when doing assessments, might be possible to integrate part of the RAMP in the system
Workers' positive experience with previously conducted work environment changes	High probability that the implementation of RAMP would be successful

The identified barriers	How may hinder the RAMP implementation?
Lack of structure and reactive approach in the systematic work environment management	– Hard to collect and structure results from the RAMP assessments – After assessments may be difficult to proceed with measures Challenge to integrate the tool in work environment routines
Lack of OHS expertise in execution of routines and activities which are part of the SWEM	– Lack of structure and support when learning the tool
Lack of usage of standardized risk assessment tools	May require more resources (time, training, personnel) for the process of implementation
Ergonomics is not integrated into the work environment management	Knowledge about ergonomics is a key factor for learning the tool in a right way
Top management supports work environment interventions with clear benefits and timeline	The implementation may not be appealing due to long time and indirect benefits

8.1 Practical Implications

Based on the identified organizational preconditions that may hinder or facilitate the RAMP tool implementation were developed specific recommendations on organizational and group levels (see Table 5). These recommendations could the worksite follow if decides to initiate the RAMP tool implementation. Moreover, the suggested time plan for the possible RAMP implementation is presented in Appendix 3.

Table 5: Developed recommendations on organizational and group levels for RAMP tool implementation at LKAB Malmberget

Stage 1 *Start of an ergonomic program*	– The educational training for worksite managers and safety representatives to learn basic knowledge about ergonomics – Can be developed and executed in cooperation with the external OHS company – The example of program content: How can one identify and solve ergonomics risks, presentation of methods for identification of ergonomics risks including the RAMP tool and other methods
Stage 2 *Selection and training of project coordinators on the RAMP tool*	– There aren't working ergonomists in LKAB Malmberget, thus should be selected project coordinators responsible for the implementation, it's recommended to include OHS-skilled in-house personnel (such as the work environment strategists or QHSE) – It is recommended that the coordinators participate in the online training courses offered by KTH Royal Institute of Technology, detailed information about the courses can be found in the references (KTH, 2023)

Stage 3 *Preparation of the pilot study of the RAMP tool*	– Internal training about the RAMP tool should be developed (a kind of shorter training meant for the future RAMP assessors, the training can be created in cooperation with consultants of the external OHS company) – During this step can be investigated if the RAMP tool items could be integrated into the internal organizational system for risk reporting – It should be also discussed who will be responsible for actions on the identified risks and how will be the actions followed – Project coordinators select 2-3 working groups that will participate in the pilot study (working groups with heavy manual tasks should be prioritized)
Stage 4 *Training of RAMP assessors*	– Because the employees' participation is well-established in the organization, it can be beneficial that worksite managers or safety delegates could become the RAMP assessors – Learning the tool by practise - evaluating tasks, practical examples – At this stage, consultants of the external OHS company could be also invited to participate and support the learning
Stage 5 *Pilot study (conducting risk assessments with the RAMP)*	– Is conducted with the support of project coordinators and eventually with the external OHS company – It is important to ensure enough resources (time and devices for filming working tasks, enough time and space for doing the assessments) – The assessments start with RAMP 1 and then with RAMP 2 – RAMP assessors discuss the results of the assessment with project coordinators including which actions will be taken on the results
Stage 6 *Evaluation of the pilot study*	– Project coordinators evaluate the pilot study – Discussion with the management regarding the possibility to integrate the RAMP tool in the organizational work environment processes in different departments

9 Conclusion

This master thesis evaluated organizational readiness for initiating the implementation of the RAMP tool in LKAB Malmberget. The evaluation resulted in the identification of the organizational preconditions that may facilitate or hinder the RAMP tool implementation. Specifically, the facilitating aspects of organizational readiness for the implementation were identified as: sufficient organizational resources for work environment activities; high management commitment for improving work environment; good organizational climate for employees' participation in work environment routines; well-integrated technological system for risk reporting; and workers' positive experience with previously done work environment changes. On the contrary, the hindering aspects of organizational readiness for the implementation were identified as: the prevalence of reactive approach in the systematic work environment management; lack of usage of standardized risk assessment tools, lack of OHS expertise in the execution of the work environment routines; ergonomics was not integrated into the work environment management; top management's tendency to support work environment interventions with clear benefits and timelines. Finally, the identification of facilitating and hindering aspects of the organizational readiness resulted in the development of practical recommendations for the worksite LKAB Malmberget which could be initiated and supported for the RAMP tool implementation.

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Appendices

Appendix 1- A: Interview Guide I

Interview guide 1		
Question	Domain	Question
1	X	Kan du berätta om din befattning och vad du jobbar med?
2	1	Kan du berätta om vad LKAB prioriterar för att skapa en bra arbetsmiljö?
3	5	Berätta hur LKABs ledning främjar nya och bättre sätt för arbetsmiljöarbetet?
4	1	Vad tycker du är den största utmaningen för LKAB inom styrning av arbetsmiljö / det systematiska arbetsmiljöarbetet?
5	4	Hur anser du att LKABs ledning prioriterar personalens utbildning/träning för att stödja förbättringar inom arbetsmiljö?
6	4	Tror du att LKABs ledning är beredd/villig att investera på personalen att lära sig nya arbetsmiljöprogram/metod? Till exempel det kan innebära att ge till personalen tillräckliga resurser - budget och tid.
7	1	Berätta om vilka aktiviteter genomförs inom det systematiska arbetsmiljöarbetet (SAM) på LKAB Malmberget? Du kan svara utifrån vad du och dina kollegor arbetar med…
8	1	Finns det något som skulle kunna förbättra när det gäller det systematiska arbetsmiljöarbetet på LKAB Malmberget?
9	5	Minns du situationen när det var initiativ för att förbättra medarbetares säkerhet/hälsa? Hur lyckades det att genomföra?
10	2	Med tanke på hantering av manuellt arbete och fysiska belastningar, hur jobbar ni på LKAB Malmberget med ergonomi? (Till exempel, att förebygga/skydda medarbetare från fysiska smärta/skador, arbetar några ergonomer på LKAB?)
11	3	Har ni något system för anställda/medarbetare för att anmäla eventuella arbetsmiljöproblem eller arbetsmiljörisker?
12	3	Hur ser det ut med hanteringen av arbetsmiljörisker och kvalitets eller produktivitets avvikelser?
13	3	Hur arbetar ni med förbättringsförslag på arbetsmiljö från verksamheterna? (t.x. Hur bearbetar ni de, tas dessa på allvar?)

Appendix 1 - B: Interview Guide II

Interview guide 2		
Question	Domain	Question
1	x	Kan du berätta om din befattning och vad du jobbar med?
2	1	Vad tror du att LKAB prioriterar för att skapa en bra arbetsmiljö?
3	5	Berätta hur LKAB:s ledning främjar nya och bättre sätt för arbetmsiljöarbetet?
4	1	Berätta om vilka aktiviter genomförs inom det systematiska arbestmiljöarbetet utifrån vad du jobbar med.
5	1	Vad tycker du är den största utmaningen för LKAB inom styrning av arbetsmiljö / det systematiska arbetsmiljöarbetet?
6	3	Brukar du genomföra riskbedömningar? Om ja, kan du berätta vilka riskbedömningsverktyg/metoder använder du?
7	3	Hur tas hand om resultater från riskbedömningar och eventuella åtgärder?
8	2	Med tanke på hantering av manuellt arbete och fysiska belastningar, hur jobbar ni med ergonomi? (Till exempel, att förebygga/skydda medarbetare från fysiska smärta/skador, arbetar ergonomer på LKAB?)
9	2	Har du själv erfarenhet av att använda metoder för att utvärdera ergonomiska risker? (om ja, vilka)
10	3	Vilka system kan använda anställda/medarbetare för att anmäla eventuella arbetsmiljöproblem eller arbetsmiljörisker?
11	3	Hur ser det ut med hantering av arbetsmiljörisker och kvalitetsavvikelser?
12	6	Kan du berätta hur ni arbetar med förbättringsförslag på arbetsmiljö?
13	1	Finns det något som skulle kunna förbättra när det gäller det systematiska arbetsmiljöarbetet på LKAB Malmberget?
14	5	Minns du en situation när det var initiativ för att förbättra medarbetares säkerhet/hälsa? Hur lyckades det att genomföra?
15	4	Hur anser du att LKABs ledning prioriterar personalens utbildning/träning för att stödja förbättringar inom arbetsmiljö?
16	4	Tror du att LKABs ledning är beredd/villig att investera på personalen att lära sig nya arbetsmiljöprogram/metod? Till exempel det kan innebära att ge till personalen tillräckliga resurser - budget och tid.
17	6	Skulle du ha motivation att lära dig ett nytt metod för riskhantering av manuellt arbete? (Eventuellt.. Varför är du inte motiverad..)

Appendix 1 - C: Interview Guide III

Interview guide 3		
Question	Domain	Question
1	x	Kan du berätta om din befattning och vad du jobbar med?
2	1	Vad tror du att LKAB prioriterar för att skapa en bra arbetsmiljö?
3	1 or 3	Kan du berätta om ditt befattningsansvar när det gäller arbetsmiljö?
4	7	Tycker du att dina chefer kommunicerar tillräckligt om arbetsmiljöfrågor (exempelvis - säkerhet, riskbedömningar)? Hur ofta till exempel…
5	5	Minns du en situation när det var initiativ för att förbättra medarbetares säkerhet/hälsa? Kan du berätta om sådan situation…? Vad lyckades…
6	4	Generellt, tror du att ni har tillräckligt kunskap att samarbeta kring arbetsmiljöfrågor/ säkerhetsåtgärder? Kan du ge exempel…
7	4	Tycker du att ni har tillräckligt mycket tid att samarbeta kring arbetsmiljöfrågor/ säkerhetsåtgärder? Varför…
8	4	Hur brukar ni hantera arbetsmiljöproblem? Vad gör ni ifall ni saknar kunskap?
9	2 or 3	Med tanke på att elektriker/mekaniker arbetar mycket manuellt och har stora fysiska belastningar, vad görs för att skydda dem från fysisk smärta?
10	2 or 3	Brukar ni utvärdera arbetsrisker / ergonomiska risker? (om ja, hur, vilka metoder)
11	2 or 3	Har du tidigare erfarenhet av riskbedömning/riskidentifiering på arbetsplatsen?
12	6	Tycker du att förslag från dig eller dina kollegor om arbetsmiljöfrågor/problem tas på allvar? varför..
13	6	Skulle du ha motivation att lära dig nytt metod för riskhantering av manuellt arbete? (Eventuellt.. Varför är du inte motiverad..)

Appendix 1 - D: Interview Guide IV

Interview guide 4		
Question	Domain	Question
1	x	Kan du berätta om din befattning och vad du jobbar med?
2	1	Vad tror du att LKAB prioriterar för att skapa en bra arbetsmiljö?
3	1 or 3	Kan du berätta om ditt befattningsansvar när det gäller arbetsmiljö?
4	4	Hur brukar ni hantera arbetsmiljöproblem? Vad gör ni ifall ni saknar kunskap?
5	2 or 3	Med tanke på att ni arbetar mycket manuellt och har stora fysiska belastningar, vad görs för att skydda er från fysisk smärta?
6	2 or 3	Brukar ni utvärdera arbetsrisker / ergonomiska risker? (om ja, hur, vilka metoder)
7	3	Har du själv erfarenhet att göra riskbedömning/riskidentifiering på arbetsplatsen?
8	7	Anser du att dina chefer kommunicerar tillräckligt om arbetsmiljö (exempelvis - säkerhet, riskbedömningar)? Hur ofta till exempel…
9	4	Generellt, tycker du att ni har tillräckligt kunskap att samarbeta kring arbetsmiljö? Kan du ge exempel…
10	4	Tycker du att ni har tillräckligt tid att samarbeta kring arbetsmiljö? varför…
11	6	Tycker du att förslag från dig eller dina kollegor om arbetsmiljöfrågor/problem tas på allvar? varför..
12	1	Finns det något som skulle kunna förbättra när det gäller det systematiska arbetsmiljöarbetet på LKAB Malmberget?
13	5	Minns du en situation när det var initiativ för att förbättra medarbetares säkerhet/hälsa? Hur lyckades det att genomföra?
14	4 or 6	Hur anser du att LKABs ledning prioriterar personalens utbildning/träning för att stödja förbättringar inom arbetsmiljö?
15	4	Tror du att LKABs ledning är beredd/villig att investera på personalen att lära sig nya arbetsmiljöprogram/metod? Till exempel det kan innebära att ge till personalen tillräckliga resurser - budget och tid.
16	6	Skulle du ha motivation att lära dig en ny metod för riskhantering av manuellt arbete? (Eventuellt.. Varför är du inte motiverad..)

Appendix 1 - E: Interview Guide V

Interview guide 5		
Question	Domain	Question
1	x	Kan du berätta om din befattning och vad du jobbar med? Malmberget, Kiruna, Svappavaara? - med vilken anläggning brukar du samarbete mest
2	x	Kan du berätta med vilka tjänster brukar ni oftast stödja LKAB?
3	4 or 6	Hur anser du att LKABs ledning prioriterar personalens utbildning/träning för att stödja förbättringar inom arbetsmiljö?
4	1	Vad tycker du är den största utmaningen för LKAB inom arbetsmiljö styrning / det systematiska arbetsmiljöarbetet?
5	1	Finns det något som skulle kunna förbättra när det gäller det systematiska arbetsmiljöarbetet på LKAB?
6	2	Med tanke på hantering av manuellt arbete och fysiska belastningar, kan du berätta utifrån ditt perspektiv hur jobbar LKAB Malmberget med ergonomi? (Till exempel, att förebygga/skydda medarbetare från fysiska smärta/skador)
7	x	Vilka riskbedömningsmetoder brukar du eller dina kollegor använda för att utvärdera ergonomiska risker av manuellt arbete?
8	x	Nu skulle jag vilja prata om RAMP verktyget, har du eller dina kollegor expertis inom Ramp 1 och Ramp 2.
9	x	Hur ofta brukar ni genomföra riskbedömningar med RAMP 1 och Ramp 2 för era klienter?
10	x	Tror du att RAMP kan vara en bra metod för LKAB? Varför?
11	x	Att implementera RAMP som riskbedömningsverktyg inom de systematiska arbetsmiljö processer på LKAB kan innebära att personalen behöver få en grund utbildning om ergonomi samt det systematiska arbetsmiljöarbetet. Tror du att ni som Företagshälsovården har kunskap att erbjuda sådana utbildningar?
12	x	Att implementera RAMP kan också innebära att LKAB personal behöver ha på sig god tid för att träna bedömningar och får stöd av erfarna ergonomer. Tror du att ni skulle kunna stödja dem?

Appendix 2 - The consent information form

Information och samtycke att delta i intervju

Syftet med masteruppsatsen är att identifiera aktiviteter som skulle kunna genomföra för att implementera riskhanteringsverktyget RAMP på LKAB Malmberget.

RAMP (https://www.ramp.proj.kth.se/se/about-ramp) är ett verktyg för bedömning och hantering av belastningsergonomiska risker i arbete med manuell hantering.

För att uppnå syftet kommer det utvärderas organisatorisk förändringsberedskap för arbetsplatsintervention. Utvärderingen kommer att hjälpa till att identifiera styrkor och svagheter som kan bidra eller hindra implementeringen av RAMP på LKAB Malmberget.

Syftet med denna intervju är att få information om medarbetarens individuella uppfattningen samt professionella erfarenheter gällande arbetsmiljöprocesser på LKAB Malmberget.

Vad händer med den information jag ger under intervjun?

Intervjusvar, inklusive den inspelade ljudfilen kommer att lagras under tidpunkten för transkription och efter att transkriptionen genomförs, ljudfilen kommer att raderas.

Deltagandet är frivilligt

Ditt deltagande är frivilligt och du kan när som helst välja att avbryta deltagandet utan att uppge varför. Ditt deltagande är anonymt.

Ansvarig person

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Samtycke till att delta i intervju

Genom att skriva under nedan bekräftar du att du har fått information om masteruppsatsen och att du samtycker till deltagande genom att medverka i intervju som avser användas för vetenskapliga analyser.

Jag har fått muntlig och skriftlig informationen om studien och har haft möjlighet att ställa frågor. Jag får behålla den skriftliga informationen.

☐ Jag samtycker till att delta i intervjun.

☐ Jag samtycker till att uppgifter om mig behandlas på det sätt som beskrivs ovan.

Datum: _____

Underskrift:

_____

Namnförtydligande:_____

Appendix 3 - Suggested time plan for the RAMP implementation at LKAB Malmberget

Stage 1 & 2	December 2023 - June 2024
Stage 3	August 2024 - October 2024
Stage 4	November 2024 - December 2024
Stage 5	January 2025 - March 2025
Stage 6	April 2025