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Transition from OSHAS 18001 of 2007 to ISO 45001 of 2018 in the petroleum industry under resource-constrained settings: a SWOT-PESTEL analysis of NOIC Feruka, Zimbabwe

By

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A research project submitted in partial fulfilment of the requirements of a Bachelor of Science Honours' degree in Safety, Health and Environmental management

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DECLARATION

To Be Compiled by the Student

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I Courage A Chifamba do hereby declare that this work is entirely the product of my own findings and has never been presented to any academic institution. Any reference to previously published work has been clearly indicated.

Signature of the student……Date……

To Be Compiled by the Supervisor

This dissertation is suitable for submission to the faculty and has been checked for conformity with the faculty guidelines.

Signature of the supervisor:  Date: 30 May 2023

ABSTRACT

Background: Globally, the total injury rate in 2021 was 10% greater than in 2020. Organisations are adopting approaches to increase their safety, health and environmental performance. Such approaches bring success, failure, threats and opportunities as they operate under different settings. This study evaluates the adoption ISO 45001 of 2018 in the petroleum industry.

Objective: To determine motivational factors influencing the transition from OSHAS 18001 of 2007 to ISO 45001 of 2018 and challenges using a SWOT-PESTEL analysis for NOIC Feruka of Zimbabwe as a case study.

Methods and materials: A cross-sectional survey was done to 27 participants at NOIC Feruka of Zimbabwe located in Mutare. A structured closed-ended questionnaire and focus group discussion were used to collect data about the transition. Descriptive statistics were used to analyses questionnaire data. A SWOT and STEL analysis was used to analyse the impacts of the transition.

Key findings: Out-datedness of OSHAS 18001 was the main motivational factor for the transition. Difficulties in understanding the new standard was the main challenge faced during the transition. The transition brought integration and alignment with other standards (*strength*), a growing customer base possibly due to improved quality of products (*opportunity*). The complexity of the standard appeared to cause non-compliance (*threat*) through ignorance and lack of understanding. However, greater improvement on workers' safety and well-being (*social factor*), adoption of new safety technologies (*technological factor*), improvement in environmental management (*environmental factor*) and compliance with both national and international OHS regulations (*legislation*) were reported.

Conclusion: The study shows a need for continual improvement in occupational safety and health management in the petroleum industry as new systems have their own weaknesses and bring in threats.

Key terms: occupational safety; performance standard; PESTEL; petroleum industry; SWOT; Transition

DEDICATION

This study is dedicated to all the different organisations that put first the safety and health of their workers. May this research project contribute to improving occupational safety and health management in the petroleum industry and other industries that prioritize occupational safety and largely promoting risk-free workplaces. Lastly, I dedicate this piece of study to tertiary students studying safety, health, and environmental management.

ACKNOWLEDGEMENTS

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CHAPTER 1: INTRODUCTION

1. INTRODUCTION

1.1 Background of the study

In 2021, the total injury rate was 10% greater than in 2020 globally (IOGP, 2022). Therefore, organisations, including those in the petroleum industry, are developing and adopting approaches to expand their safety, health and environmental performance (Reese, 2018; Seman et al., 2019, Obeidat et al., 2020). Occupational Health and Safety Assessment Series 18001 (OHSAS), a management system, was introduced to control occupational health and safety (OHS) threats for better performance (Kaur et al., 2021). However, despite its great performance, it had several drawbacks including, its inflexibility, poor documentation and focusing only on risks associated with OHS hazards in workplaces (Liu and Yang, 2016). Thus the introduction of ISO 45001 which emphasises managing other risks and opportunities along with controlling these OHS hazards (Karanikas et al., 2022).

For continual improvement, organisations that had adopted OHSAS 18001 have migrated to ISO 45001 for example Colas Rail (Kumar and Bhatia, 2017; Jones, 2017). The transition to ISO 45001 had perceived positive and negative impacts on the petroleum industry. According to Ruhinda and Zengeni (2020) it influenced the alignment of management systems, risk management, and stakeholder engagement. However, it also introduced challenges related to documentation, training, and potential resistance to change. SWOT is an analytical strategic planning tool that is used to identify internal (strengths and weaknesses) and external factors (opportunities and threats) that can impact the success of the organisation (Chen and Chang,

2015). STEL analyses the external macro-environmental factors (social, technological, environmental, and legal) that can affect the organisation and help identify potential opportunities and threats (Zavareh et al., 2019). SWOT and STEL have been used as analytical tools separately or combined (Sarsby, 2016; Perera, 2017; Kumar and Bhatia, 2017).

The establishment of the ISO 45001:2018 standard in Zimbabwe was reported for the oil industry, for NOIC Zimbabwe (Mutsago and Mbohwa 2018). This reflects a growing national recognition of the importance of OHS. However, clear motivational factors that led to this transition and its resultant impacts in the petroleum industry in Zimbabwe appears not well reported. Further, earlier studies evaluated the adoption of either of the standards without the transition itself (Habidin et al., 2020; Morgado et al., 2019; Marhavilas et al., 2022). The current study attempts to provide an independent evaluation of the transition from OSHAS 18001 of 2007 to ISO 45001 of 2018 in the petroleum industry using a case study of NOIC Zimbabwe.

1.2 Problem statement

There has been increasing occupational accidents and injuries in the petroleum industry globally (IOGP, 2022). The adoption of OHSMS appears well reported for organisations in high-income countries (Mpofu, 2017). Industrial technological advancement brings new occupational hazards which require continual improvement, which are poorly reported in low-and middle-income countries (Zavareh et al., 2019). Further, literature appears to indicate that research interest is focused on the adoption of a standard particularly in LMICs (Mpofu, 2017) without evaluating the transition from one to the latest. Such a transition is perceived to have challenges and opportunities (Jones, 2017). The use of a SWOT-PESTEL analysis to evaluate the transition is also uncommon for the petroleum industry.

1.3 Aim

To evaluate the transition from OSHAS 18001 of 2007 to ISO 45001 of 2018 by a petroleum industry in Zimbabwe using SWOT and PESTEL analysis.

1.3.1 Specific objectives

- To identify motivational factors influencing the transition from OSHAS 18001 of 2007 to ISO 45001 of 2018 by NOIC Zimbabwe.
- To determine challenges that were faced during the transition from OSHAS 18001 of 2007 to ISO 45001 of 2018 by NOIC Zimbabwe.
- To determine impacts of the transition from OSHAS 18001 of 2007 to ISO 45001 of 2018 by NOIC Zimbabwe using SWOT and STEL analyses.

1.4 Research questions

- What were the factors influencing the transition from OSHAS 18001 to ISO 45001 by NOIC Zimbabwe?
- What challenges were faced during the transition at NOIC Zimbabwe?
- What are the perceived impacts of the transition from OSHAS 18001 to ISO 45001 by NOIC Zimbabwe?

1.5 Significance of the study

The study would provide an independent evaluation of the transition from OSHAS 18001 of 2007 to ISO 45001 of 2018 by NOIC Zimbabwe. Findings may be used to inform organisational policy and practices including similar organisations. The results may add to the current debate on literature to continually improve OHS by organisations under resource-constrained settings. The combination of SWOT and PESTEL analyses provide a unique analysis that would help

organisations to make informed decisions about the transition process and providing insights into potential impacts looking at a macro-economic view.

1.6 Assumptions

- Full cooperation from NOIC employees to participate.
- Research instruments will get relevant data to achieve the objectives.
- Limited retirements and/or transfers in the key workforce to affect collection of data.

1.7 Limitations

- Limited time requirement to collect, analyse data and write a report
- Availability of sensitive organisational data
- Data availability due to the inclusion of management in data collection

1.8 Delimitations

- Period studied: 2012 to 2022, adoption of the standard to new certification
- focused on one of the five branches of NOIC (Feruka).
- Using full-time employees appointed as SHE representatives and the management.

CHAPTER 2: LITERATURE REVIEW

2. LITERATURE REVIEW

2.1 Introduction

This chapter reviews published literature on the transition from OSHAS 18001 of 2007 to ISO 45001 of 2018 in the petroleum industry under resource-constrained settings. It compares the two standards and, reviews perceived motivational factors for the transition, challenges faced and the application of SWOT and STEL.

2.2 OHS in the petroleum industry

Occupational Health and Safety issues within the petroleum industry is dealt with through implementing comprehensive management systems that align with internationally recognized standards which includes OSHAS 18001 and/or ISO 45001 (Brocal et al., 2019). These management systems are there to make sure that occupational health and safety risks are identified, evaluated and successfully controlled through introduction of adequate controls, procedures, and trainings (Komunda et al., 2015). In advanced settings, OHS is regarded as the critical element of overall business performance and substantial investments are made in the development of OHS programs and the provision of resources to support their implementation.

In resource-constrained settings within the petroleum industry, the management of OHS issues can be more challenging. Limited financial and human resources may make it difficult to implement comprehensive OHS management systems and to provide adequate training and resources for workers (Ribeiro et al., 2017). In these settings, OHS risks may be managed

through basic hazard assessments, safety procedures, and the provision of personal protective equipment. However, the lack of resources and infrastructure can make it difficult to address more complex health and safety risks such as exposure to hazardous chemicals or the provision of emergency medical services (Kachali et al., 2018). As a result, workers in resource-constrained settings may be more vulnerable to OHS risks, and the potential for accidents and injuries may be higher (Darabont et al., 2018).

2.3 Overview of OHS standards

OSHAS 18001 of 2007, a British standard, mainly aims at managing OHS risks requiring organisations to develop OHS systems e.g., policies, procedures and controls (Kaynak et al., 2016). ISO 45001 of 2018 highlights the significance of worker participation and consultation in the management of OHS risks, as well as coming up with a comprehensive approach to manage those risks (ISO, 2018). It is based on the "Plan-Do-Check-Act" (PDCA) cycle.

According to Jones (2017) similarities of OSHAS 18001 and ISO 45001 include:

- management of OHS risks using a framework
- expect organisations to develop an OHSMS with policies, procedures and controls
- necessitate organisations to keep on reviewing and improving their OHSMS
- demand organisations to adhere to legal and other requirements related to their OHSMS
- require documentation of OHSMS in organisations although ISO 45001 has a more detailed and complicated documentation.
- contain worker participation in management of OHS risks although ISO 45001 requires organisations to establish a process that includes worker participation.

Table 2.3 provides a comparison of the two

Table 2.3 Differences between OSHAS 18001 and ISO 45001 (Jones, 2017)

OSHAS 18001 of 2007	ISO 45001 of 2018
• comprises framework to manage OHS risks • does not use a cycle e.g., PDCA cycle • expects organisations to identify and manage OHS risks, but does not require organisations to identify opportunities. • excludes worker participation and consultation processes • does not include consideration of the context of the organization • contains a part of continual improvement	• extra comprehensive approach to manage OHS risks • relies on PDCA cycle to manage risks • Requires organisations to identify risks and opportunities that potentially disturbs OHS performance. • focuses on, and demands organisations to develop a process for worker participation and consultation on OHS risks management. • considers context of organisation including needs and expectations of interested parties that may affect OHSMS • focuses on continual improvement and requires organisations to establish a process for continual improvement.

2.4 Perceived motivational factors for the transition from OHSAS 18001 to ISO 45001

The transition from OHSAS 18001 to ISO 45001 appears to be motivated by several factors. One key factor is the desire to improve occupational health and safety (OHS) performance (Eyiah et al., 2019). ISO 45001 places a greater emphasis on risk management and continuous improvement than OHSAS 18001, encouraging organisations to identify and mitigate OHS risks more effectively (Neag et al., 2020). This is particularly important in industries where workers are exposed to high levels of risk, such as construction, manufacturing, and mining. By adopting ISO 45001, organisations can demonstrate their commitment to providing a safe and healthy workplace for their employees.

Another factor driving the transition to ISO 45001 is the need to align with international standards (ISO, 2018). ISO 45001 is based on the Annex SL framework, which provides a common structure and language for management system standards (ISO, 2018). This makes it easier for organisations to integrate OHS management with other management systems, such as quality management (ISO 9001) and environmental management (ISO 14001). Adopting ISO 45001 also demonstrates an organization's commitment to international best practices and can enhance its reputation with stakeholders, including customers, suppliers, and regulators.

2.5 Challenges faced during the transition from OHSAS 18001 to ISO 45001

The transition from OHSAS 18001 to ISO 45001 can present several challenges for organizations, particularly in industries such as healthcare and construction, where the risks to worker safety are high (Sarsby, 2016). One challenge is the need to update existing OHS management systems to meet the new requirements of ISO 45001. This can involve significant changes to policies, procedures, and processes, as well as additional training for staff (Sarsby,

2016). Organisations may also need to conduct a gap analysis to identify areas where their existing systems do not meet the new standard.

Petroleum operations involve hazardous activities like drilling, refining, and transportation of hydrocarbons that require stringent health and safety controls (Obeidat et al., 2020). Organisations have to assess risks from exposure to toxic chemicals, fires, explosions and worker fatigue due to shift work. Petroleum companies often have geographically dispersed operations including offshore platforms, pipelines and tankers that complicate the implementation of health and safety practices (Pham and Vu, 2021). Overcoming these industry-specific challenges requires strong leadership, allocation of substantial resources and close collaboration with regulators and workers.

2.6 Potential impacts of the transition from OHSAS 18001 to ISO 45001

The transition from OHSAS 18001 to ISO 45001 was reported to have both positive and negative impacts on organizations, particularly in the petroleum industry. One of the positive impacts of the transition was that ISO 45001 placed a greater emphasis on the involvement of top management, which leads to improved safety culture and increased commitment to health and safety (Seman et al., 2019). According to ISO (2018) report, the benefits such as, improved worker participation and consultation, boosted trust and confidence in stakeholders and customers, and improved occupational health and safety performance in organizations. Additionally, ISO 45001 was more comprehensive than OHSAS 18001, as it covered a wider range of hazards and risks, and provided a more systematic approach to managing health and safety (Sarsby, 2016).

However, there were also potential negative impacts of the transition. For example, the transition required significant changes to existing health and safety management systems, which can be time-consuming and costly (Pham and Vu, 2021). Additionally, some organisations struggled with the increased emphasis on risk-based thinking, as that required a more proactive approach to identifying and addressing potential hazards and risks. In the petroleum industry, the transition also pose challenges related to the complexity and high-risk nature of operations, which requires specialized expertise and resources to effectively implement and maintain ISO 45001 compliance (ISO, 2018; Makoni, 2019).

2.7 Application of SWOT as an analytical tool

SWOT analysis was originally developed for use in strategic planning but has since been applied to a range of business functions, including marketing, product development, and risk management (Kumar and Bhatia, 2017). It involves conducting an assessment of internal and external factors that impact an organization's performance and using this information to develop strategies for improving operations and achieving business objectives (Sarsby, 2016).

In the petroleum industry, SWOT analysis can be used to identify opportunities for growth, assess potential risks, and develop strategies for improving safety and environmental performance (Kumar and Bhatia, 2017), evaluate organisational production processes and identify areas where efficiency could be improved or cost savings realized (Kumar and Bhatia, 2017), and to assess the impact of emerging technologies on the industry and identify opportunities for innovation and growth (Kumar and Bhatia, 2017). According to Pham and Vu

(2021, (i) strengths in the petroleum industry: access to reserves, established infrastructure, and significant capital investment, (ii) weaknesses: dependence on finite resources, environmental impact, and regulatory challenges, (iii) opportunities: new technologies, expansion into new markets, and diversification of operations, and (iv) threats: fluctuating demand, competition from other energy sources, and regulatory and legal challenges.

2.8 Application of STEL as an analytical tool

STEL analysis considers the social, technological, environmental, and legal factors that can influence business operations and performance (Lamm and Massey, 2014). It identifies opportunities and threats that may arise from these factors and to develop strategies to address them. In the petroleum industry, STEL analysis can be used to assess the impact of social, technological, environmental, and legal factors on operations (Kumar and Bhatia, 2017; Lamm and Massey, 2014; Makoni, 2019).

Combining SWOT and STEL analyses, organisations can gain a more comprehensive understanding of their operations and the potential risks and opportunities they face. The advantage of using SWOT-STEL analysis is that it allows organisations to develop strategies that address both internal and external factors that impact their operations (Perera, 2917. The application of SWOT-STEL analysis can be used in a variety of industries, including the petroleum industry, to help organisations navigate complex and constantly evolving markets (Lamm and Massey, 2014).

2.9 Summary

The transition from OSHAS 18001 of 2007 to ISO 45001 of 2018 comes with opportunities and threats in the petroleum industry of a resource-constrained organisation in a developing country. Combing SWOT and STEL analyses comes with an advantage than using one of them. These can be used in the petroleum industry. Organisations need to be well informed to plan for the transition as there are potential challenges that come with it. Literature appears to lack studies that used SWOT-PESTEL analysis in a resource-constrained petroleum organisation. More attention was given to high income settings. Further, evaluations appear to be based on the adoption of a standard without including the transition itself.

CHAPTER 3: METHODS AND MATERIALS

3. METHODS AND MATERIALS

3.1 Description of the study area

The study was conducted at NOIC Feruka depot located on the outskirts of Mutare, adjacent to the Feruka railway station, eastern Zimbabwe (Fig.3.1). The area is characterised with a climate that is classified as a humid subtropical, with an annual rainfall range of 800 - 900 mm and an annual temperature of 20.72 0C (Chikodzi et al., 2018). NOIC Zimbabwe is an organisation that is largely involved in the procurement and distribution of petroleum products nationwide. The core business of NOIC Zimbabwe is importing of crude oil, refining it into various petroleum products, distributing them to customers; and storing and transporting services to clients. The organisation underwent transition from OSHAS 18001 of 2007 to ISO 45001 of 2018 in 2022

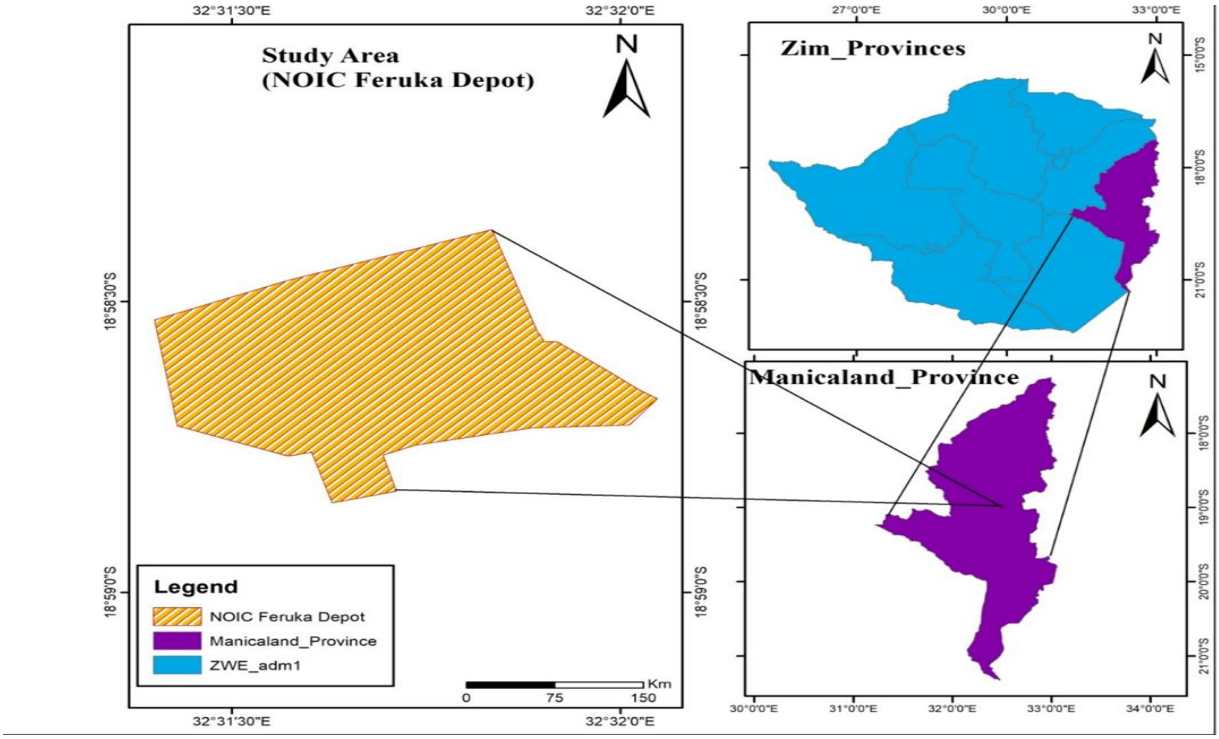

Figure 3.1 Map of Mutare showing the location of NOIC Feruka, Zimbabwe

3.2 Research design

A cross sectional survey was adopted for a case study using a petroleum organisation. The corss sectional study is appropriate as data collection on a particular subject of interest was done at a single point in time (Saleh and Bista, 2017). It allows a comparison of different variables at the same time in a sizeable population (Komunda et al., 2015)

3.3 Theoretical framework

The systems theory of accident causation (STAC) can contribute to identify the different factors that may contribute to the successful transition to ISO 45001 in the petroleum industry in NOIC Feruka, Zimbabwe. To examine the physical environment, e.g., equipment and facilities used in the industry, human factors, e.g., skills and training of workers, and organisational factors, e.g., culture and management systems of the organisation. Analysing these factors and their interactions using STAC can enable a better understanding of the complex system that governs the implementation of ISO 45001 in the petroleum industry.

3.4 Determination of sample size, recruitment on selection of participants

NOIC Feruka has 42 employees. An inclusion procedure was that a participant should be a permanent employee with more than one-year experience working at NOIC Feruka, with basic knowledge on ISO standards and safety, health and environmental (SHE) practices. This was ascertained from the assumption that for an employee to be appointed as a SHE representative, one must be a holder of a SHE certificate with basic knowledge of ISO standards. There was no further exclusion based on gender, physical ability and race. The inclusion principle resulted in a sample size of 27 participants (Table 3.2).

Table 3.2 Recruitment of participants

Department	Population	Sample	% sampling intensity
Administration	16	9	56
Laboratory	6	3	50
Storage	4	3	75
Loading Bay	14	8	57
Maintenance	4	4	100
Total	44	27	61

3.5 Research instruments

3.5.1 Closed-ended questionnaire

The study used a 14-item closed- ended questionnaire (Appendix 1) to collect data on motivational factors for the transition from OSHAS 18001 of 2007 to ISO 45001 of 2018, challenges faced and perceived impacts. The questionnaire was also used to collect data on strengths, weaknesses, opportunities and threats that came with the transition. A closed-ended questionnaire makes it easier to compare and classify data, which simplifies data analysis (Žukauskas et al., 2018). The questionnaire was compiled using ISO standards (ISO 45001:2018 and ISO 14001:2015), and past SHE-related questionnaires from literature that were SHE related (Lamm and Massey, 2014).

3.5.2 Focus group discussion

The study used focus group discussion (FGD) to collect data on the impacts of the transition from OSHAS 18001 of 2007 to ISO 45001 of 2018. The FGD promotes deeper engagement with the participants (Lamm and Massey, 2014) although it is difficult to engage a larger group

(Barbour, 2016). Two FGDs were held each consisting of five participants moderated by a SHE officer for not more than an hour (Appendix 2)

3.6 Validity and reliability

The questionnaire was validated by the research supervisor and the SHE manager of NOIC Feruka before use. It was developed from existing instruments in literature (ISO 45001:2018, ISO 14001:2015, Lamm and Massey, 2014) therefore, considered reliable. Pre-testing of the questionnaire was done with five employees. It indicated that the instrument could be easily understood by the participants and it collected the required information.

3.7 Ethical considerations

Applicable principles of research ethics (Žukauskas, et al., 2018) were considered for the study participants: informed consent, anonymity, voluntary participation and confidentiality of shared information. Permission to carry out the study was granted in writing from NOIC Feruka management (Appendix 3). The purpose of the study was explained to all participants before verbally granting their informed consent to participate. The identities of participants were not included in the questionnaire responses. Participation was voluntary and there was freedom by participants to withdraw anytime if there were any discomfort caused by the study.

3.8 Data collection

The questionnaire was administered by the SHE officer to 27 recruited participants. A short meeting was held during lunch. Participants were debriefed on study and their how they would participate. They were given two days by the SHE Officer to complete the questionnaire so that the study could not affect their work-related duties. Upon submission, the SHE Officer checked for completeness and correctness of the questionnaires. Two FGDs (five participants each) were

held at NOIC Feruka. The chosen participants would gather during lunch time and the SHE officer would read out the topics:

1. What do you think was the impact of the transition from OSHAS 2007 to ISO45001 of 2018?
2. May you categorise each impact identified as a strength, weakness, opportunity or threat to the organisation

The moderator would give the participants the chance to air out their views and contributions while taking notes and audio-recording.

3.9 Data Management

The data were checked for completeness and errors before being entered into the Statistical Package for the Social Sciences (SPSS) version 20 for analysis. Descriptive statistics were used to analyse and present motivational factors for, and challenges faced by the transition. Data from the FDG were analysed using thematic analysis (Clarke and Braun, 2017). Written notes by the moderator and transcribed audio-recorded discussions were used to generate initial codes by identifying words and phrases or sentences. The codes are then grouped according to similar ideas and then make themes. The themes are reviewed by going through them over and over again and then they are given names. This was done to come up with both strengths, weaknesses, opportunities and threats, and social, technological, environmental and legal factors that came along with the transition. Thematic analysis can provide valuable insights into participants' experiences, attitudes, and beliefs, and guide decision-making in practice (Clarke and Braun, 2017).

CHAPTER 4: RESULTS

4. RESULTS

4.1 Demographic characteristics of the participants

Table 4.1 shows the demographic characteristics of participants. Results show that the participants were predominantly male (70.4%) with an age range of 36-50 years of age. The largest number of participants had a working experience of 6 years and above (81.1%).

Table 4.1 Demographic characteristics of participants showing association on the key factors that drove the organisation to transition (n= 27). Figures in bold denote significant association

($p < 0.05$)

				Pearson Chi-Square test	
Variable	Categories	*n*	%	Chi-square value	p value
Gender	Male	19	70.4		
	Female	8	29.6	11.630	**0.009**
	21 – 35	14	51.9		
Age group (years)	36 - 50	12	44.4	15.281	**0.018**
	> 50	1	3.7		
work experience (years)	5	5	18.5		
	6 - 10	15	55.6	5.772	0.449
	>10	7	25.9		
level of education	O level	7	25.9		
	Diploma/Degree	20	74.1	3.737	0.291

4.2 Motivational factors for the transition

Fig.4.1 shows motivational factors influencing the transition from OSHAS 18001 to ISO 45001. The results indicate that poor involvement of employees in decision making of the OSHAS 18001 standard was self-reported reported the commonest motivating factors (81.5%) for the transition. Reduction in productivity was reported as the least motivating factor (19%).

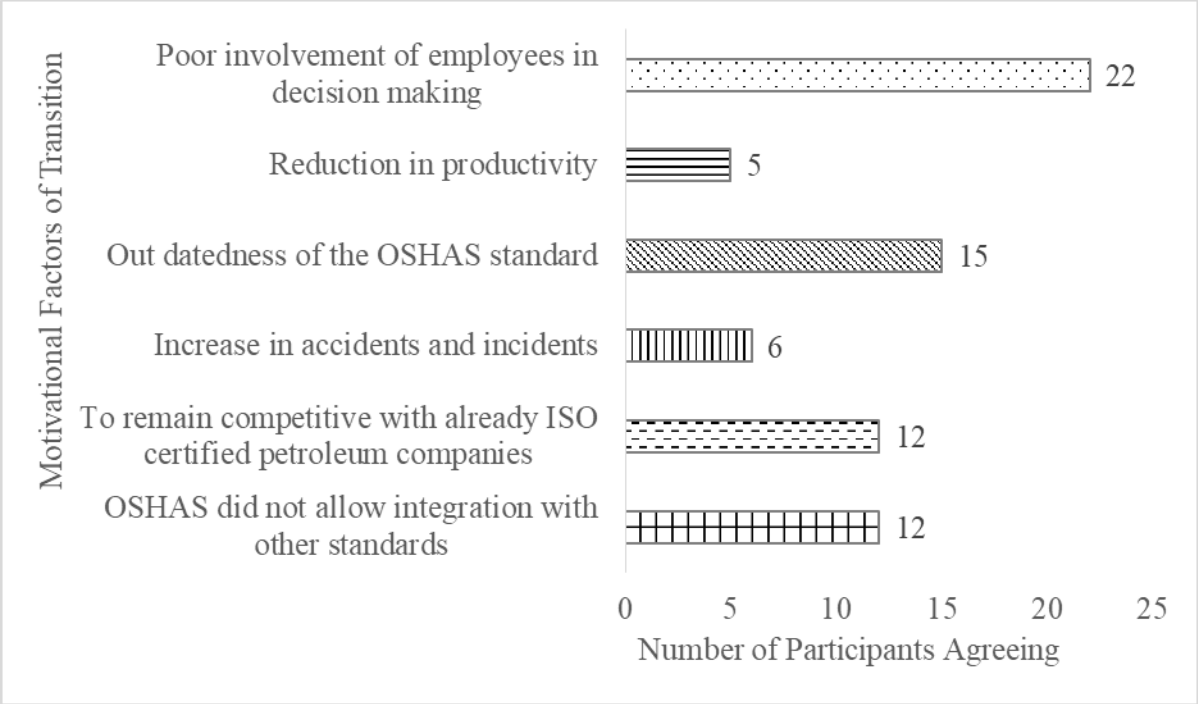

Fig. 4.1 Motivational factors for the transition to ISO 45001

4.3 Challenges faced during the transition

Fig. 4.2 shows the challenges that were faced at NOIC Zimbabwe during the transition to ISO 45001. Results indicate that most participants perceived that the organisation faced the challenges of difficulties in understanding the new framework (40%). Documentation and records complexity was reported to be a challenges by the least participants (3%).

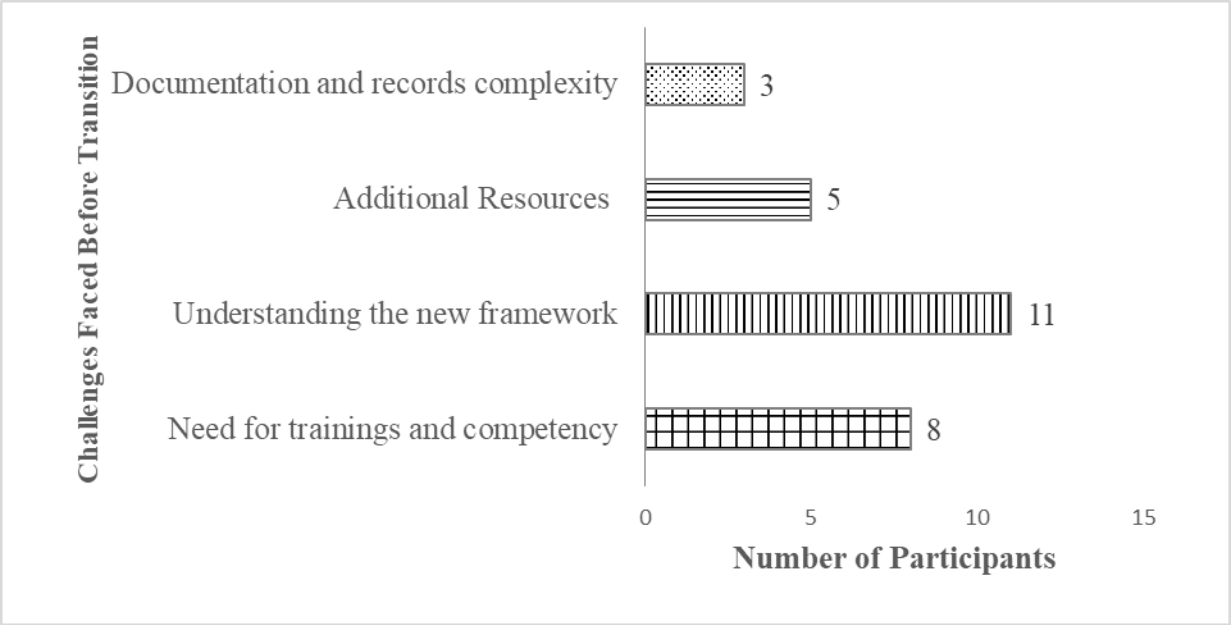

Fig. 4.2 Challenges faced during the transition

4.4 The impacts of the transition

4.4.1 SWOT analysis

Fig. 4.3 shows the strengths, weaknesses, opportunities and threats found in NOIC Zimbabwe established using SWOT analysis. Bolded factors were the most mentioned by participants. About 38% of the participants agreed that the transition brought stronger focus on worker safety (*strength*) as they were receiving PPE after every six months as stated in the Health, Safety and Environment procedure. However, the standard is more detailed requiring high level of documentation (*weakness*) as mentioned by 50% of the participants. Most of the participants (61.5%) reported that the transition came with organisational effectiveness and efficiency to provide better quality of product (*opportunity*). Evidence was given through customer feedback. Complexity of the standard (*threat*) was also mentioned by participants (53.8%).

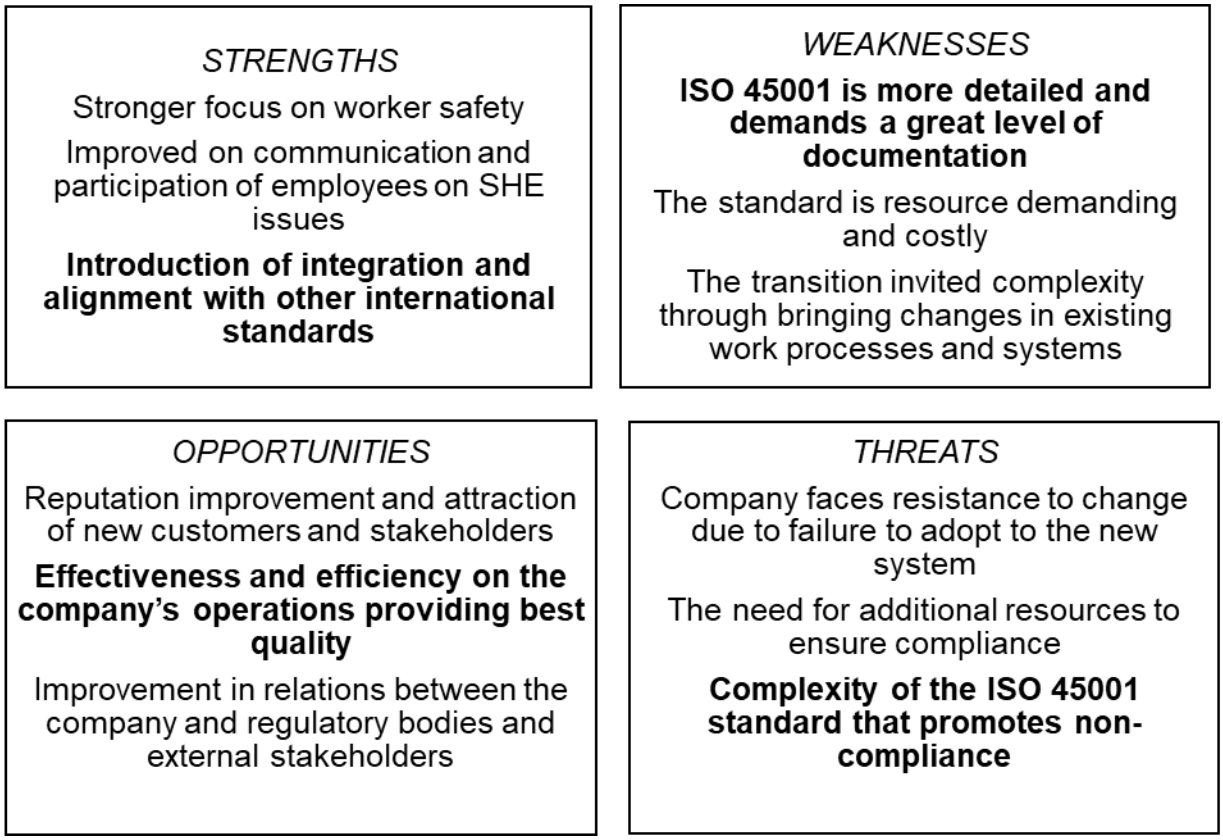

Fig. 4.3 SWOT analysis results: impacts of transition

4.4.2 STEL analysis

Table 4.2 shows the STEL factors that came along with the transition. Bolded factors were highlighted by a greatest proportion of participants. About 57% of the participants from the study agreed that the improvement on worker safety and well-being (*social*), and adoption of new safety technology was brought about by the transition (*technology*). Integrating with ISO 14001 improved environmental management (*environmental factor*) was brought by the transition as stated by 61.5% of the participants. Improved compliance with OHS regulations was reported (*legal*) by 57.7% of the participants.

Table 4.2 Results of STEL analysis: impacts of transition

SOCIAL	TECHNOLOGICAL	ENVIRONMENTAL	LEGAL
• **A great improvement on worker safety and well-being** • Boosted trust and confidence of stakeholder and customers • Promoting community engagement as a result of reduction in negative impacts to the environment	• **Adoption of new safety technology** • Improvement on risk assessment and management • Improvement on management and analysis of data	• Reduction in environmental degradation that promoted sustainability in business practices • **Improvement in management of the environment through integrating with ISO 14001** • A great enhancement in management of waste and sustainable use of resources	• **Full compliance with national and international OHS regulations.** • Promotion of smooth audits and inspections by improved reputation with regulatory bodies • Great opportunity for the company to access markets that put first adherence to ISO standards a prerequisite for doing business.

4.5 Demographic characteristics of the participants in the FGD

Participants from the FGD (Table 4.3) were both male and female with either a SHE representative or an Integrated Management System certificate. All participants had post-secondary education with a working experience greater than six years. Discussions were done within 40 minutes.

Table 4.3 Demographic characteristics of FGD participants

Variable	Category	n	%
Gender	Male	7	70
	Female	3	30
Certification/Training in Health, Safety & environment	SHE Rep	4	40
	IMS	6	60
Education	Diploma/Degree	10	100
Working experience (years)	6 - 10	7	70
	> 10	3	30

4.6 Impacts of the transition: Thematic analysis results of FGD

Fig. 4.4 shows thematic areas of impacts (benefits and shortcomings) of the transition from OSHAS 18001 to ISO 45001. Results indicate that there were internal and external factors that were brought by the transition that were used as codes to generate themes. The themes generated from codes included strengths, weaknesses, opportunities, threats, social, technologies, environmental and legal factors. A major benefit (*strength*) that was mentioned four times by different participants from both FGDs was the ability to integrate with other ISO standards. One participant had to say:

"…through integrating ISO 45001 with other standards, it enables involving risk assessment and management when using the other ISO standards 14001 and 9001 and that's promoting safe workplaces for all workers"

Three participants from the FGDs mentioned that the transition came improved well-being of employees (*social factor*). One participants noted:

"the transition boosted confidence and trust of stakeholders and customers … well-being of employees". Well managed waste created good relations and engagement with the community"

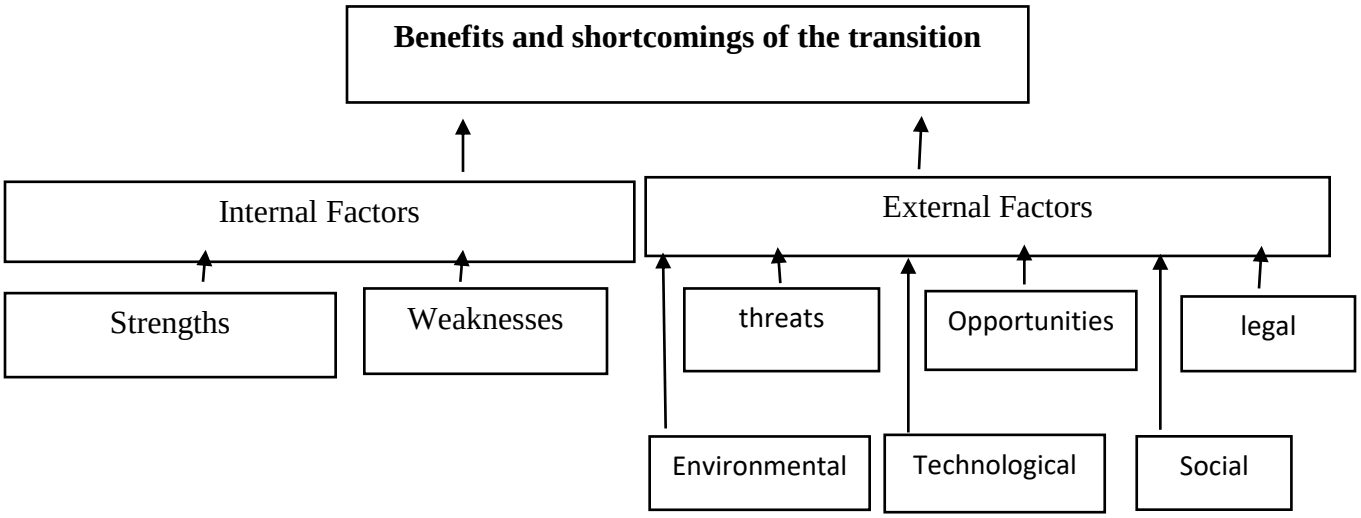

Fig. 4.4 Thematic areas of impacts of the transition *(2 FGDs, n = 10).*

Participants mentioned that the organisation adopted new safety equipment (*technological factor*) after the transition. It doubles as an *environmental factor*. This was happily and boldly expressed by a participant:

"W*e can monitor activities in the tank farm and any potential hazard from the office using CCTV. The risk of losing our product through over flowing is reduced. Further, since the introduction of the electronic truck loading system, spillages recorded per quarter are reduced"*

The transition requires a lot of documentation that come with audits that check for compliance *(legal factor*). Although participants identified three shortcomings (*weaknesses*) that were brought by the transition, they appeared to agree on one as the major issue that the standard was more complicated requiring extensive training to understand it. That implementing the standard was costly and required a lot of resources were also mentioned. One participant noted:

"… the standard demands a lot of resources but the major problem is that it is complex. It requires trainings …"

Participants observed that the company witnessed a growing customer base possibly due to improved quality of products (*opportunity*). The complexity of the standard appeared to cause non-compliance (*threat*) through ignorance and lack of understanding by employees. A participant explained:

"…the ISO Standard has high complexity that is leading to bridging of procedures and, health and safety protocols as a result of poor understanding…"

CHAPTER 5: DISCUSSION

5. DISCUSSION

5.1 Demographic characteristics of participants

The study was dominated by men mostly of middle age. The harsh working conditions in the heavy industry favor men (Karanikas et al., 2022). The history of oil, and gas shows male dominance (Kaur et al., 2021). Further the middle age group is generally referred to as the most productive age group (Sarsby, 2016). This finding has a bearing on the gender that is generally exposed to occupational hazards in this industry.

5.2 Motivational factors for the transition

The transition was necessitated by the need to be in tandem with new hazards that require new methods of control as the existing one appeared outdated for safety of employees. The new standard focuses on the processes of the organisation, and where the new hazards and risks emerges from (ISO, 2018). Poor employee participation in decision making which characterises OSHAS 18001 (Ruhinda and Zengeni, 2020) is avoided.

The transition from OSHAS 18001 to ISO 45001 can be motivated by several factors, including the desire to improve worker safety and health, enhance organizational performance, and comply with legal and regulatory requirements. According to the standard ISO 45001 of 2018, it places greater emphasis on leadership, worker participation, and risk management, which can lead to a more effective safety culture, improved communication, and increased workforce engagement and satisfaction (Sarsby, 2016). Clearly, it seems that there is some consistency in the motivational factors for the transition from OSHAS 18001 to ISO 45001, but there may be some

differences in the way these factors are emphasized and the outcomes that are expected from the new standard. But above there is a similarity between the research study and the related studies concerning the transition.

5.3 Challenges faced during the transition

The resistance to change by employees to a new procedure is reported in literature (Reese, 2018). Employees may resist the change to a new procedure because they are uncertain about what the change will mean for their job responsibilities, work environment, or job security and additionally, employees may resist the change if they do not fully understand the new procedure, its requirements, and benefits (Seman et al., 2019). ISO 45001 is a comprehensive standard which requires a lot of documentation (ISO, 2018). Its implementation was shown to require a lot of resources, commitment from management and employee engagement. Additional training and competency were challenges reported elsewhere (Reese, 2018).

The transition from OSHAS 18001 to ISO 45001 in the petroleum industry may face challenges such as resource constraints, where companies may struggle to allocate sufficient resources (Obeidat et al., 2020), and a lack of awareness and understanding of the new standard, resulting in resistance to change and inadequate support (Pham and Vu, 2021). The studies show that the challenges are similar to my findings because petroleum industry requires similar operations.

5.4 The impacts of the transition

Participants identified the introduction of integration and alignment with other international standards as a strength of the transition. This is consistent with the findings of other studies, which have highlighted the benefits of ISO 45001's alignment with other management system

standards, such as ISO 9001 and ISO 14001. To a greater extent this opportunity improves an organization's reputation and competitiveness in the market (Pham and Vu, 2021). The participants identified ISO 45001's greater level of detail and demands for documentation as a weakness of the transition, which is in agreement with the observation by Sarsby (2016) of the need for additional resources and documentation.

The challenge to fully understand and implement the ISO 45001standard which come with additional costs, delays in work progress and difficulties in adoption of the new changes (Pham and Vu, 2021). The participants identified the potential for increased effectiveness and efficiency in the company's operations as an opportunity of the transition, being consistent with the aims of ISO 45001 to improve organizational performance and reducing the incidence of work-related injuries and illnesses (ISO, 2018).

The opportunity of improvement on the quality of the product reported in this study agrees with Darabont et al. (2018)'s report. Further, the complexity of the ISO 45001 standard as a threat to compliance is in line with the challenges of understanding and implementing the new standard by Pham and Vu (2021). Improvement in worker safety and well-being is consistent with the aims of ISO 45001; improving OHS and promoting worker well-being (ISO, 2018). The technological factor of the transition was pointed out by Obeidat et al. (2020) in monitoring and controlling hazards and risks. NOIC Zimbabwe can manage the opportunities of transitioning to ISO 45001 by developing a comprehensive plan, providing sufficient resources, and fostering leadership and employee engagement. Seeking external support from consultants or industry

associations may also help to achieve the potential benefits of the new standard and integrate with other management systems.

The findings of the SWOT and STEL analyses have practical implications for companies transitioning to ISO 45001. To address the challenges of implementing the new standard, companies should consider developing a comprehensive implementation plan that addresses their specific needs, provides sufficient resources, and fosters leadership and employee engagement throughout the process (Sarsby, 2016; Darabont et al., 2018). Seeking external support from consultants or industry associations with expertise in implementing ISO 45001 and integrating with other management systems may also help companies to achieve the potential benefits of the new standard (Obeidat et al., 2020). The potential benefits of transitioning to ISO 45001 include improving worker safety and well-being, adopting new safety technology, improving environmental management, and achieving full compliance with legal requirements (ISO, 2018; Obeidat et al., 2020).

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6. CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

SWOT-STEL analysis may effectively be used to evaluate the impacts of adopting a new OHSMS. The transitioned from OSHAS 18001 of 2007 to ISO 45001 of 2018 was mainly motivated by the desire for an all-inclusive approach to occupational health and safety management. It Noted improvements. Despite its complexity, demanding for documentation and the need for additional resources, the transition enhanced worker safety and well-being, environmental awareness, and compliance to legislation. The transition requires to be well-informed to inform other organisations for effective planning. Findings add on to the current debate on the adoption of latest occupational safety management systems. Future work may include to evaluate the effect of the transition on occupational performance.

6.2 Recommendations

- The transition requires careful planning to ensure successful implementation for continual improvement.
- On-going training, review and audits may be needed to establish a safety culture based on adopting a new OHSMS which facilitates conformance.

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APPENDICES

Appendix 1: Close Ended Questionnaire

Questionnaire No.

BINDURA UNIVERSITY OF SCIENCE EDUCATION

DEPARTMENT OF ENVIRONMENTAL SCIENCE

RESEARCH QUESTIONNAIRE

Introduction

My name is Courage Chifamba pursuing a degree in Safety Health and Environmental Management at Bindura University of Science Education. I compiled this questionnaire to gather information that will assist me in a research entitled **"The transition from OSHAS 18001 of 2007 to ISO 45001 of 2018: a SWOT and PESTEL analysis of the petroleum (NOIC Zimbabwe) industry".** The study aims to come up with factors that promoted the transition and the internal and external factors that was brought by the transition according to SWOT and PESTEL analysis at NOIC Zimbabwe industry.

The results that are going to be acquired from this survey are for academic purposes only and will not prejudice anyone who takes part in the survey. The information you are going to put out on this survey will not be traced back to you because there is no mentioning of names. Participation is voluntary and there is freedom by participants to withdraw anytime if it happens to be any discomforts caused by the study. Thank you very much for taking part in this important survey.

Completion of the questionnaire is voluntary, anonymous and confidential. Be assured that all answers you provide will be kept in confidentiality.

Guide to responding to the questionnaire

- Please do not write your name to ensure you remain anonymous.
- Your responses will be treated with confidentiality.
- Complete the questions by ticking your preferred response in front of the space provided.

SECTION A: DEMOGRAPHIC DATA

1. Department:

   1 Loading Bay **2** Administration **3** Laboratory **4** Engineering

2. Gender: **1** Male **2** Female

3. Age:

   1 20 years and below **2** 21-35 **3** 36- 50 **4** 51 years and above

4. Work Experience: **1** 5 Years **2** 6-10 Years **3** 10+ Years (3)

5. Level of Education: **1** 'O' level **2** 'A' Level **3** Diploma/Degree

6. Certification/Training in HSE:

   1 First Aid **2** SHE Rep **3** Fire Fighter **4** IMS **5** Food Handler

   If other, please specify……

SECTION B: MOTIVATIONAL FACTORS FOR THE TRANSITION

7. What are the main challenges that were faced by the company during the transition?
   1 (a) Need for trainings and competency
   2 (b) Difficulties in understanding the new framework
   3 (c) Need for additional Resources
   4 (d) Documentation and records complexity
8. Which of the following contributed to transitioning to ISO 45001?
   1 (a) inadequacy trainings e.g. no conduction of refresher trainings

2 (b) OSHAS did not allow integration with other standards

3 (c) to remain competitive with other petroleum companies which are ISO certified

9. Before the transition was NOIC complying with other international standards besides OSHAS 18001 for example ISO 14001, ISO 9001?

1 Yes **2** No **3** Not Sure

10. Before the transition was NOIC's customers and stakeholders conforming to ISO 45001?

1 Yes **2** No **3** Not Sure

11. Before the transition were NOIC's competitive companies certified to ISO 45001.

1 Yes **2** No **3** Not Sure

12. Does the organisation involve employees in decision making concerning SHE issues for example on compiling corrective actions?

1 Yes **2** No **3** Not Sure

12. What is the key factor that drove the organisation to transition to ISO 45001?

1 (a) increase in accidents and incidents **2** (b) out datedness of the standard

3 (c) poor employees involvement in SHE issues **4** (d) reduction in productivity

SECTION C: IMPACTS OF THE TRANSITION

13. What is the main strength that was brought by the transition amongst the given?

1 (a) Stronger focus on worker safety e.g. Adequate provision of PPE/C (after every 6 months).

2 (b) Improvement on communication and participation of employees on SHE issues

3 (c) It brought integration and alignment with other international standards e.g. ISO 9001

14. What weakness came along with the transition from OSHAS 18001 to ISO 45001?

1 (a) ISO 45001 standard is more detailed and demands a great level of documentation

2 (b) The standard is resource demanding and costly

3 (c) The transition brought changes in existing work processes and systems inviting complexity in work activities

15. What is the greatest opportunity created through transitioning to ISO 45001?

1 (a) Reputation improvement and bringing in of new customers and stakeholders

2 (b) effectiveness and efficiency on the company's operations providing best quality

3 (c) improvement in relations between the company and regulatory bodies and external stakeholders

16. Which is the biggest threat that was brought by the transition

1 (a) company faces resistance to change due to failure to adopt to the new system

2 (b) the need for additional resources to ensure compliance

3 (c) complexity of the ISO 45001 standard that promotes non-compliance

17. What was the main benefit of transitioning from OSHAS 18001 to ISO 45001?

1 (a) provision of best quality to customers shown by positive feedbacks

2 (b) promotion of self-advertisement through offering best services

3 (c) reduction in number of accidents and incidents recorded per quarter

18. What is the main social factor that was brought by the transition?

1 (a) a great improvement on worker safety and well-being

2 (b) boosted trust and confidence of stakeholder and customers

3 (c) promoting community engagement as a result of reduction in negative impacts to the environment

19. What is the major technological factor that came along with the transition?

1 (a) there was adoption of new safety technology

2 (b) improvement on risk assessment and management

3 (c) improvement on management and analysis of data

20. What is the main environmental factor that was brought by the transition?

1 (a) reduction in environmental degradation that promoted sustainability in business practices

2 (b) improvement in management of the environment through integrating with ISO 14001

3 (c) a great enhancement in management of waste and sustainable use of resources

21. What is the major Legal factor that came out because of the transition to ISO 45001?

1 (a) full compliance with both national and international occupational safety and health regulations.

2 (b) promotion of smooth audits and inspections by improved reputation with regulatory bodies

3 (c) Great opportunity for the company to markets that put first adherence to ISO standards a prerequisite for doing business.

Appendix 2: Focus Group Guideline

Focus Group Discussion Guideline

Introduction

1. Welcoming and thanking the participants for attending

2. Explaining the purpose of the focus group

3. Reminding the participants that the discussion will be audio recorded but their responses will remain confidential.

Icebreaker Question

1. Overall thoughts about the meaning and understanding on the phrase “Transition from OSHAS 18001 to ISO 45001”

Main Discussion Question

1. What are the perceived positive impacts that came along with the transition?

2. What are the perceived negative impacts that came along with the transition?

Wrap-Up

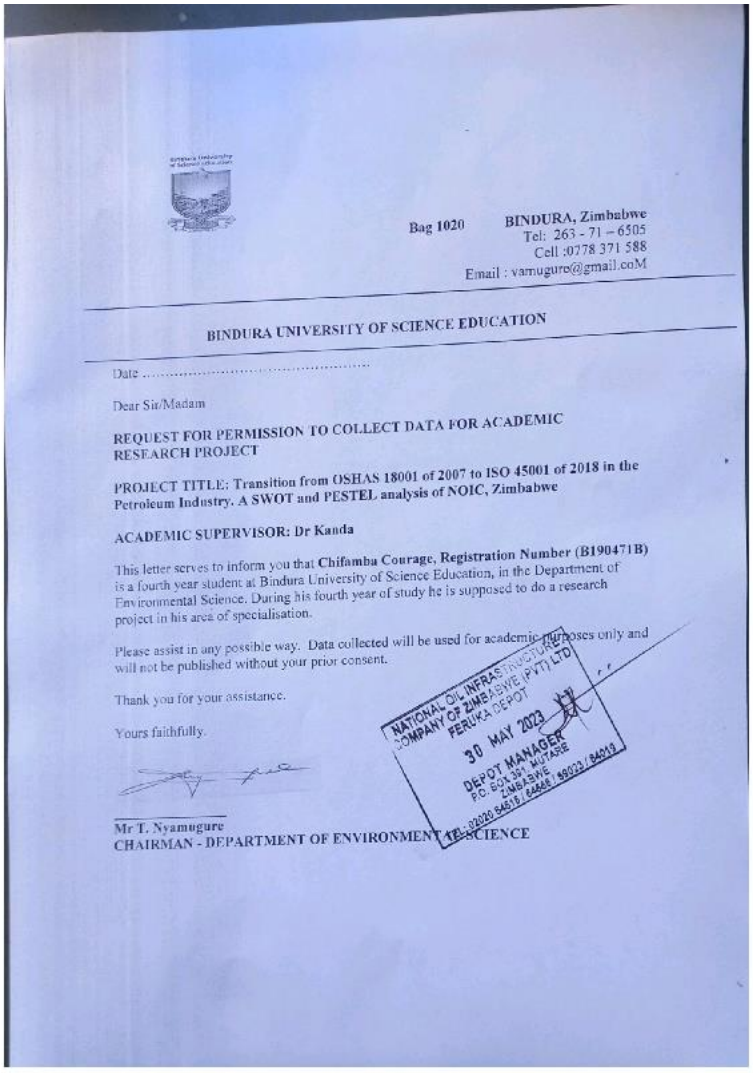
1. Summarize key points, and Asking for additions and subtractions.

2. Thanking participants for attendance and contributions.

Thematic analysis

Firstly, there was familiarization of that data recorded from the participants through reading and re-reading so as to develop a better understanding of the data. After understanding the data, there generation of codes by identifying words and phrases or sentences that were related to SWOT. In addition, the codes were being linked to the appropriate segment of in the SWOT and STEL analysis. There was identification of themes next, these themes were merging from the codes and specifically relating and linking to SWOT and STEL analyses. Then, there was reviewing of the themes by going over them again and again to make sure that they are linking to data collected and linking to the analyses, also to conclude if the themes are supported by the data. After concluding if the themes are bringing out the concept in the data collected, the themes are then named. A short description for the theme is given and then comes the name of the theme.

Appendix 3 Permission Letter



Bag 1020 BINDURA, Zimbabwe
Tel: 263 - 71 – 6505
Cell :0778 371 588
Email : vamugure@gmail.coM

BINDURA UNIVERSITY OF SCIENCE EDUCATION

Date .....

Dear Sir/Madam

REQUEST FOR PERMISSION TO COLLECT DATA FOR ACADEMIC RESEARCH PROJECT

PROJECT TITLE: Transition from OSHAS 18001 of 2007 to ISO 45001 of 2018 in the Petroleum Industry. A SWOT and PESTEL analysis of NOIC, Zimbabwe

ACADEMIC SUPERVISOR: Dr Kanda

This letter serves to inform you that **Chifamba Courage, Registration Number (B190471B)** is a fourth year student at Bindura University of Science Education, in the Department of Environmental Science. During his fourth year of study he is supposed to do a research project in his area of specialisation.

Please assist in any possible way. Data collected will be used for academic purposes only and will not be published without your prior consent.

Thank you for your assistance.

Yours faithfully.

NATIONAL OIL INFRASTRUCTURE COMPANY OF ZIMBABWE (PVT) LTD FERUKA DEPOT 30 MAY 2023 DEPOT MANAGER P.O. BOX 391 MUTARE ZIMBABWE TEL: 20/20 54519 / 54468 / 59023 / 54019

Mr T. Nyamugure
CHAIRMAN - DEPARTMENT OF ENVIRONMENTAL SCIENCE

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