JOURNAL LA MULTIAPP

VOL. 06, ISSUE 01 (130-148), 2025
DOI: 10.37899/journallamultiapp.v6i1.1881

Analysis Implementation Human and Organizational Performance Uses Evaluation Maturity Level in Animal & Nutrition Health Business

Noverto Marlin Suyono Sitohang[1], Adhithya Sudiarno[1]

[1]*Industrial and Systems Engineering Department, Institut Teknologi Sepuluh Nopember, Surabaya*

**Corresponding Author: Noverto Marlin Suyono Sitohang*

Article Info

Article history:
Received 17 August 2021
Received in revised form 14 January 2025
Accepted 30 January 2025

Keywords:
Human and Organizational Performance (HOP)
Safety Culture
Risk Management
Incident Analysis
Maturity Level Assessment

Abstract

This study analyzes the implementation of Human and Organizational Performance (HOP) using maturity level assessment in the Animal & Nutrition Health business of PT Cargill Indonesia. The research focuses on evaluating the impact of HOP integration, including leadership, training, communication, incident management, and risk assessment programs, on safety culture and compliance. Data collection involved surveys, structured interviews, and incident trend analyses before and after HOP deployment. Findings reveal significant improvements in safety maturity levels, incident reduction, and the effectiveness of corrective and preventive actions. The study emphasizes the critical role of organizational culture in fostering safety compliance and offers recommendations for enhancing safety practices.

Introduction

Cargill is a company engaged in the field of business food owned by a large, successful, and successful family from land agriculture pioneers in the American Midwest. Its origins can trace return more from 140 years to started with facility storage grains simple that sprinkles seed for business growing foods that help support and maintain so Lots from We moment This. Cargill was founded own objective namely Taking care of the world with safe, responsible way responsible, and sustainable *"Nourishing the world in a safe, responsible and sustainable way".*

In terms of *"Safety"*: Cargill has commitment term long to safety for Cargill employees, and for man as well as animals that consume our food and feed. On *"Responsible"*: Cargill is united by a set of belief strong ethics namely Cargill's Guiding Principles. In a changing world every that day is base from all done. In terms of "*Sustainable*": Generation day this and the future You're welcome need system useful food. Cargill is builds solution for make it happen. The Operation Map of PT Cargill Indonesia is shown in Figure 1 below. This:

In accordance with Constitution Number 1 of 1970 concerning Safety Article 2 work, where determined that every activities that can cause danger and risk so called as place work and must operate terms and conditions safety Work as poured out in Article 3 namely company required For do a number of matter that is Prevent and reduce accidents, Prevent, reduce and extinguish fire, Prevent and reduce danger blasting. In case for reach objective from Safety Work the then PT Cargill Indonesia does not let go from efforts safety planned, measurable, structured and integrated work. This is very clearly visible in the 3 safety slogans Work in

ISSN: 2716-3865 (Print), 2721-1290 (Online)

policy company namely We put safety above profit, Cargill prioritizes safety than Benefits, we believe that every job can and must be done safely, We believe that all work can and must done Safely and We hold every responsibility for stopping any unsafe act and unsafe conditions, We ask everyone is responsible answer For stop behavior and conditions that are not safe.

Policy the above is also implemented in a way seriously by the company through several integrated programs like: System Management Occupational Safety and Health (SMK3) as set up in PP no. 50 of 2012 concerning Implementation System Management Safety Work, Occupational Health and Safety Management System (ISO 45001) and the Assessment Program Rating Program Company Performance ranking in Management Environment. Data from the Organizing Agency Social Security (BPJS) Employment in 2020 figures accident Work total 221,740 cases. In 2021 the figure increase to 234,270 cases. The latest data in 2022 shows the number of accident Work recorded as many as 265,334 cases. The data is the successful data collected until November 2022. One of the reason improvement incident accident Work is implementation and supervision Occupational Safety and Health (K3) at the same time behavior public industry in particular and society in general, which still not enough realize importance implementation of K3 norms in the workplace work. Risk control accident Work Not yet attempted in a way Keep going continuously through efforts approach safety both modern through approach system and in a way simple only with install signs, signs safety and push workers so that their behavior care to safety work. Approach new related error man own the fundamental reason like poor working conditions, stress from companies, and conflicts interests that can result in the occurrence trap error from a number of things that are not Can controlled. Error somebody No Can Again only seen as consequence from activity Humans and Failure performance man for become reason base to A accidents. As an effort to prevent work accidents, several researchers have tried to model the relationship between safety climate and work accidents. (Liu et al., 2015; Schwatka & Rosecrance, 2016) showed that work accidents are influenced by safety climate, supervisor response, co-worker response, worker attitudes and safety behavior.

In addition to safety climate, Shuen & Wahab (2016) stated that safety communication (safety communication) is an important contributor to improving safety in the workplace. Likewise, safety behavior is an approach designed to improve work safety performance directly so that it can prevent accidents (Mohammadfam et al., 2017). Compliance with safety regulations describes the core activities that a person must carry out to maintain a safe workplace (Kohn et al., 2023). Furthermore, safety compliance includes compliance with safety regulations, following proper procedures, and using proper equipment. One of the factors that influences compliance with safety regulations is safety climate. Safety climate is the perception of policies, procedures, and practices related to safety. On a broader level, safety climate describes workers' perceptions of the value of safety in an organization (Griffin & Curcuruto, 2016). In this study the author want to do development of the Human and Organizational Performance (HOP) model for provide the influence of organizational culture and safety climate on occupational safety compliance at PT Cargill Indonesia through Event Analysis (Incident Investigations), High Risk Of the Day, and Pre-Job Hazards Analysis Program.

Occupational Health and Risks is combination from level frequency the occurrence dangerous work or exposure and level severity from accident and disease consequence work, ISO 45001:2018 Clause 3.21. PJHA is the process of identifying steps work done for analyzing the language and risks that are usually used for non-routine and unscheduled work has SOP ISO 45001:2018 clause 6.1.2.1. Event analysis (Incident investigations) is incident that occurs from or during, work that can be done or of course result in injury and illness. The incident that caused injury and illness sometimes called as an “accident”. The incident Where No

ISSN: 2716-3865 (Print), 2721-1290 (Online)

happen injuries and illnesses, but potential cause injury, can referred to as “almost” “wretched”, “almost hit” or “almost” happened”. And even though there is One or more the discrepancy that related with the incident, the incident can also happen when No There is ISO 45001:2018 non-conformity clause 3.35 Incidents.

Explanation related picture the above principles is existence A system that shows connection interconnectivity between all elements. The elements in question is employees, programs, processes, environment work, organization, and equipment. Relationship interconnectivity This is very important and frequent thing impact on the system and can cause problem or obstacles. For example, if there is error man so will impact to matter others, can influence to a process, program or others. Therefore, the company develop ability think in frame find solution in repair system. On the other hand in implementation of safety programs the company has also own system For do evaluation Serious Injury Fatality Maturity Index namely one of evaluation related Maturity level every sites that use implementation parameters Serious Injury Fatality Observation program, Life Savers Field Check, LifeSavers Deepdive, Structural Steel Assessment and Serious Injury Fatality Elimination program which are the levels of maturity index the divided top to bottom level to the highest level namely emerging, transitional, proactive and leading where results assessment has been done is between Proactive and Leading level based on the matrix that has been approved by the company.

In general specific for evaluate related to the Human and Organizational Performance (HOP) Maturity program Already available globally for company However Not yet implemented in a way comprehensive all of them business , For the development of this model, the author run the deployment program what is done in business Animal, Nutritions and Health PT. Cargill Indonesia, this process will done through a comprehensive program consisting of on a number of element like leadership , training , shift change / production , description short pre-task stop and search criteria help , observation field . Validation, investigation Incident and Root Cause Analysis causes, procedures use and upgrade / Step by Step, and checking self/Verbal Point Touch. And the general in the its implementation Later will grouped in three big programs namely Event Analysis, High Risk Of the Day, Pre-Job Hazards Analysis. In running this program at the point end writer will Conduct related analysis results implementation use Human and Organizational performance Road Map and Assessment tools that have been developed by the company and analyzed impact from the deployment program carried out as well as application tools that will used in the its implementation For do evaluation level maturity level in matter implementation safety in the organization with use Capacity Culture Model and Culture Safety Model with see trend aspect of the report accidents and Serious Injury and Fatality (SIFp) potential.

Literature Review

Proposed research is shows that how influence implementation from Human and Organizational Performance (HOP) in build Culture Occupational Health and Safety in the company. Therefore that, the research that will be done among them culture safety, maturity safety company, principles safety, influence implementation of the Human and Organizational Performance (HOP) program in increase achievement company in field safety work, and the method that will be used for measure the success of this program.

The purpose of its establishment company This is for become leader in fulfil need world food with a safe, responsible and sustainable way. In this time 's research business that becomes location study is business feed livestock and fish feed. Where in general covers the first process is the process of acceptance material standard in loading area and unloading purchased from supplier, after through the agreed checking and formulator process in

ISSN: 2716-3865 (Print), 2721-1290 (Online)

accordance request customers and markets then the next process will carried out in the production area. After finished for processes carried out in the production area so will continued in the packaging area which will later will forwarded to customer in accordance with needs and orders submit.

Draft culture safety appear from analysis the 1986 Chernobyl accident at the power plant electricity power nuclear. Where even though reason at first considered as failure technique design with contribution failure equipment operational, but enough anxiety that reason direct This Possible No root reason remember the worst accident there it is displacement going to practice industry standard For investigate more in to the roots reason accident. Analysis Chernobyl incident applies approach with do outside investigation failure technique bring to focus performance of 'people' who manage, design, build or operate facility dangerous including covers psychology why people behave they do it on the spot work and how they interact with complex technology. In addition, the factor social environment work that forms beliefs and attitudes to safe operation become important. From the investigation technical the Chernobyl incident with full concentration on the ' person dimension ', emerged that culture safety organization that does not adequate possibility is contributor main accident said.

Develop culture good safety own benefit extensive business. Research disclose that culture good safety more from just amount behavior safety individual but own attributes that are not tangible. There is a ' spirit ' of business a growing cohesive organization from behavior integrated safety to in all activity work. The same importance is a real transfer to other functions of principles system management the safety that provides approach integrated for business. Belief will importance safety business at stage This has embedded as part from spirit and identity organization (Pandey et al., 2009). Just Culture is also a something something that is very possible influence for the formation of A culture Where organization No may use Bad Apple theory so everyone wants report every device error in place Work without existence blaming culture. Companies must also respond related all trap reported error as well as Balancing Safety and Accountability (Hunt & Auster, 1990).

Evaluation of safety culture in an accident can provide important information with threshold values that threaten the safety of Nuclear Power Plants. In other words, in terms of safety culture, latent problems of business processes or work environments in nuclear power plants can be revealed by analyzing how workers perceive and act in serious accident situations (Kim et al., 2018). In building principles guide performance employees and organizations as a system there is a number of something that really influences namely mark organizations that influence behavior individual, performance based on reinforcement and motivation self, recognition that situation with trend error can prevented, as well as incident can avoided with understand and apply lessons learned (Stranks, 2007).

There are 2 types necessary failure be noticed in carry out and understand the process for move more proceed in the process of understanding No only method investigate accident However How ensure matter the No repeat back and be learning in organization namely the failure individual and failure organization (Kayes, 2015). Employee and Organizational Performance is about improving our capabilities at the task and step level. Therefore that, in doing evaluation related common mistakes appear in settlement a work according to GEMS there is three performance mode that can made into as base for determine it. Safety Culture Assessment survey is methods and tools that can used For evaluate maturity level of the organization in matter implementation of safety programs and already used in some projects in Europe such as (MASCA, InnHF, ManuVAR, Hilas) which survey This first initiated by Laguna University which is part from the Hilas project.

ISSN: 2716-3865 (Print), 2721-1290 (Online)

One of the assessment model maturity levels is Dupont Bradley Curve which has tested by (Siuta et al., 2022) who developed Safety Culture Maturity Model. In this model share Safety Culture become four part namely reactive, dependent, independent and interdependent (Siuta et al., 2022). At the reactive level people don't own not quite enough answer to safety. According to the model (Denison, 1996) adopted by (O'Reilly et al., 1991) that There are five stages and the level of maturity level adopted from typology of organizational culture. Krzywdzinski (2017), this study focuses on the Automotive Industry which has now developed into a complex and highly automated sector. This level of automation and complexity has led to the formation of a work environment, where humans and machines work together and human reliability is now a critical factor in performance, especially for safety-critical tasks. The aim is to support root cause evaluation and estimate the probability of human error.

Xue & Fu (2018), through his research related Human and Organizational factors are carried out that is using the Swiss cheese model for general aviation (SCM-GA) with combine it with regulation applicable laws and regulations as well as rule related management safety. Peng-Wood et al. (2013), research conducted in the industry generator power Nuclear This focus on change the system used previously use equipment control conventional and changing to a more modern control system. Aydin et al. (2021), research This carried out in the Mariene and Dan industries more specific to the business tanker is based on the aspect of human error. Lyons et al. (2004), research done on development method Human Reliability Analysis (HRA) is carried out previously.

Grabowski & Roberts (1996) focus on research This is in the sector harbor Where role important in understand factor humans and their importance culture safety in the sector maritime become the warm. However, required further research focused on greater complexity specific. Cheong Yong & Emma Mustaffa (2012), focus research conducted is in the field construction projects in Malaysia with see the most significant factor responsible answer on management risk is factor human beings. Roberts & Bea (2001), research conducted focus on the field business train fire fast Where has happen a series an accident which requires attention to aspects factor organization and institutions. Peter et a. (2021), focus study carried out in industries that have an Ammonia process with analyze factor organization with system protector using Bowtie. Man et al. (2021), research This carried out in the field construction using the Construction Worker Risk-Taking Behavior (CoWoRTB) model and getting deep understanding related mechanism factor personal greatly influences organization which of course influence behavior taking risk worker construction.

Schöbel et al. (2022), research conducted in the industry generator electricity power nuclear namely started with identify Human Organizational Factors (HOF) after applied for 50 years and focuses on 2 aspects important that is First see HOF Historical Perspective Based on 3 Accidents Serious related nuclear and HOF management in the field with involving managers generator electricity power nuclear through method interview and as conclusion obtained that HOF should entered into the activity safety design equipment , and potential danger related . The result identifying a number of points important to be considered in to design change in complex industry, and how framework or system model socio-technical.

Methods

The research was conducted at PT Cargill Indonesia's Animal and Nutritions Health Business from August to September 2023, involving six factories. A preliminary study utilized the HOP Maturity Matrix, completed by plant managers and safety officers, to assess safety maturity levels. Data from Enablon, a company-owned system, was reviewed quarterly to analyze the Serious Injury Fatality (SIF) Maturity Index and verify field implementation. The study aims

ISSN: 2716-3865 (Print), 2721-1290 (Online)

to provide insights into the maturity level of HOP application and serves as a resource for enhancing safety programs.

In the model development phase, key variables were identified from previous research and validated through surveys using the Safety Culture Assessment Survey (SCAS) and the Culture Safety Maturity Model by Foster and Hoult (2013). A systematic research framework ensured comprehensive results, with questionnaires targeting influential variables for HOP implementation. The research flow incorporated sequential steps to achieve thorough analysis and actionable outcomes.

Results and Discussion

Respondents who will take part in this survey will be asked to answer questions using the terminology of agree or disagree using a Likert Scale with the following scale ranking types (strongly agree, agree, neutral, disagree, strongly disagree) and there is also a section provided if there are additional statements or input on the survey being conducted.

Data Collection and Description of Research Objects

The object of this study will be conducted in 6 *Animal Nutrition and Health factories* in PT Cargill Indonesia which have 230 employees who are distributed using the *Office Form application* to facilitate data collection and reduce technical errors in filling from manual to online and prevent data manipulation. The distribution of this survey to all levels of employees is to prevent drawing conclusions that are limited to only one point of view of position, length of service and age of the worker.

Before collecting survey data, checking and ensuring understanding of the intent and purpose of the survey had been communicated to the management and supervisors of PT Cargill Indonesia both through online meetings using *Microsoft Teams* and in person in order to produce more optimal data.

Initial Test Results

Through the results of observations conducted in the initial survey, several problems and input from workers in the field were found, as follows: 1) The use of terms in English is not well understood by respondents, especially workers from the sales and commercial departments, so they need further explanation virtually, for example the terms *unsafe act*, *unsafe condition*, *nearmiss* and *accident.* and *human error;* 2) Some questions seem repetitive so that improvements need to be made and this is communicated to the *Plant Managers* and also the K3 Expert personnel on site. For example, there is a *Leadership element* that often intersects with the elements of communication, training, incident management systems and *risk management;* 3) Some respondents also had some difficulty filling out the survey due to the limited *smartphone devices* owned by workers, so they needed to get help from the K3 Expert personnel at their respective locations.

Background Information Obtained

Through the *Office Form link* sent to *the Plant Manager* , K3 Expert, and also through *Microsoft Teams chat* , the Author managed to collect data from 104 respondents. The majority of the survey results obtained came from the operational team as much as 65% Managerial Level 12% and Supervisor Level 12%.

Safety Culture Assessment Tools (SCAS)

Descriptive Test Crostab Statistics Data

Crosstab test aims to analyze the relationship between two variables so that the frequency distribution of the combination of two variables can be seen in the form of a table by crossing

ISSN: 2716-3865 (Print), 2721-1290 (Online)

the variable categories. *Crosstab* will be used to determine the research variables based on the demographics of respondents and in this study it is used for department, age, education, length of service and position. The results of the department and age *crosstab analysis* shown in Table 5.1 from a total of 104 respondents are dominated by respondents from the *warehouse department* aged 36-45 years.

Table 1. *Department Crosstab Table* - Age

Crosstab Department - Age							
			Age				**Total**
			> 55	**46 - 55**	**36 - 45**	**26 - 35**	
Department	Administration and Support team	Count	**0**	**0**	**4**	**1**	**5**
		% within Department	0.0%	0.0%	80.0%	20.0%	100.0%
		% of Total	0.0%	0.0%	3.8%	1.0%	4.8%
	Environmental Health and Safety	Count	0	1	2	1	4
		% within Department	0.0%	25.0%	50.0%	25.0%	100.0%
		% of Total	0.0%	1.0%	1.9%	1.0%	3.8%
	Laboratory	Count	0	0	5	3	8
		% within Department	0.0%	0.0%	62.5%	37.5%	100.0%
		% of Total	0.0%	0.0%	4.8%	2.9%	7.7%
	Etc	Count	1	1	0	2	4
		% within Department	25.0%	25.0%	0.0%	50.0%	100.0%
		% of Total	1.0%	1.0%	0.0%	1.9%	3.8%
	Maintenance	Count	0	6	9	1	16
		% within Department	0.0%	37.5%	56.3%	6.3%	100.0%
		% of Total	0.0%	5.8%	8.7%	1.0%	15.4%
	Production	Count	0	12	20	1	33
		% within Department	0.0%	36.4%	60.6%	3.0%	100.0%
		% of Total	0.0%	11.5%	19.2%	1.0%	31.7%
	Project	Count	0	0	0	1	1
		% within Department	0.0%	0.0%	0.0%	100.0%	100.0%
		% of Total	0.0%	0.0%	0.0%	1.0%	1.0%
	Sales and Commercial	Count	0	5	9	0	14
		% within Department	0.0%	35.7%	64.3%	0.0%	100.0%
		% of Total	0.0%	4.8%	8.7%	0.0%	13.5%
	Warehouse	Count	0	7	12	0	19
		% within Department	0.0%	36.8%	63.2%	0.0%	100.0%
		% of Total	0.0%	6.7%	11.5%	0.0%	18.3%
Total		Count	1	32	61	10	104
		% within Department	1.0%	30.8%	58.7%	9.6%	100.0%
		% of Total	1.0%	30.8%	58.7%	9.6%	100.0%

ISSN: 2716-3865 (Print), 2721-1290 (Online)

The crosstab analysis in this table for the last education and department show that 2 respondents with junior high school education work in *frontliner positions (mechanics and operators).* Meanwhile, respondents with high school/vocational school education mostly occupy the *frontliner position (mechanics, operators)*. Respondents with a diploma education occupy the *frontliner position (mechanics, operators and Environment Health and Safety)*. Respondents with a bachelor's degree mostly occupy positions in *Sales* and *Commercial* and Production Management.

Table 2. *Department Crosstab Table* – Education Level

Crosstab								
			Education					Total
			Master's degree	Bachelor's degree	Associate	School Upper Middle School	School Intermediate First	
Department	Administration and Support team	Count	0	5	0	0	0	5
		% within Department	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
		% of Total	0.0%	4.8%	0.0%	0.0%	0.0%	4.8%
	Environmental Health and Safety	Count	0	2	2	0	0	4
		% within Department	0.0%	50.0%	50.0%	0.0%	0.0%	100.0%
		% of Total	0.0%	1.9%	1.9%	0.0%	0.0%	3.8%
	Laboratory	Count	1	7	0	0	0	8
		% within Department	12.5%	87.5%	0.0%	0.0%	0.0%	100.0%
		% of Total	1.0%	6.7%	0.0%	0.0%	0.0%	7.7%
	Etc	Count	0	4	0	0	0	4
		% within Department	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
		% of Total	0.0%	3.8%	0.0%	0.0%	0.0%	3.8%
	Maintenance	Count	0	4	1	10	1	16
		% within Department	0.0%	25.0%	6.3%	62.5%	6.3%	100.0%
		% of Total	0.0%	3.8%	1.0%	9.6%	1.0%	15.4%
	Production	Count	2	6	1	23	1	33
		% within Department	6.1%	18.2%	3.0%	69.7%	3.0%	100.0%
		% of Total	1.9%	5.8%	1.0%	22.1%	1.0%	31.7%
	Project	Count	0	1	0	0	0	1
		% within Department	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
		% of Total	0.0%	1.0%	0.0%	0.0%	0.0%	1.0%
	Sales and Commercial	Count	0	14	0	0	0	14
		% within Department	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
		% of Total	0.0%	13.5%	0.0%	0.0%	0.0%	13.5%
	Warehouse	Count	0	3	1	15	0	19
		% within Department	0.0%	15.8%	5.3%	78.9%	0.0%	100.0%
		% of Total	0.0%	2.9%	1.0%	14.4%	0.0%	18.3%
Total		Count	3	46	5	48	2	104

ISSN: 2716-3865 (Print), 2721-1290 (Online)

	% within Department	2.9%	44.2%	4.8%	46.2%	1.9%	100.0%
	% of Total	2.9%	44.2%	4.8%	46.2%	1.9%	100.0%

Furthermore, the results of *the crosstab analysis* in table 5.3 for respondents who have a work period of >1 year - 5 years and >5 years - 10 years working for the *frontliner department (*production, *warehouse* and *maintenance) and laboratory.* While those who have work experience of >15 - 20 years, the majority of respondents come from the frontliner (production *department)*

Table 3. *Department Crosstab Table* – Length of Service

Crosstab								
			Years of service					**Total**
			>1 year - 5 years	**>5 years - 10 years**	**>10 years - 15 years**	**>15 years - 20 years**	**>25 years**	
Department	Administration and Support team	Count	**0**	**4**	**1**	**0**	**0**	**5**
		% within Department	0.0%	80.0%	20.0%	0.0%	0.0%	100.0%
		% of Total	0.0%	3.8%	1.0%	0.0%	0.0%	4.8%
	Environmental Health and Safety	Count	1	2	1	0	0	4
		% within Department	25.0%	50.0%	25.0%	0.0%	0.0%	100.0%
		% of Total	1.0%	1.9%	1.0%	0.0%	0.0%	3.8%
	Laboratory	Count	1	5	2	0	0	8
		% within Department	12.5%	62.5%	25.0%	0.0%	0.0%	100.0%
		% of Total	1.0%	4.8%	1.9%	0.0%	0.0%	7.7%
	Etc	Count	2	0	1	0	1	4
		% within Department	50.0%	0.0%	25.0%	0.0%	25.0%	100.0%
		% of Total	1.9%	0.0%	1.0%	0.0%	1.0%	3.8%
	Maintenance	Count	2	4	7	3	0	16
		% within Department	12.5%	25.0%	43.8%	18.8%	0.0%	100.0%
		% of Total	1.9%	3.8%	6.7%	2.9%	0.0%	15.4%
	Production	Count	2	7	11	13	0	33
		% within Department	6.1%	21.2%	33.3%	39.4%	0.0%	100.0%
		% of Total	1.9%	6.7%	10.6%	12.5%	0.0%	31.7%
	Project	Count	1	0	0	0	0	1
		% within Department	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%
		% of Total	1.0%	0.0%	0.0%	0.0%	0.0%	1.0%
	Sales and Commercial	Count	2	8	3	1	0	14
		% within Department	14.3%	57.1%	21.4%	7.1%	0.0%	100.0%
		% of Total	1.9%	7.7%	2.9%	1.0%	0.0%	13.5%
	Warehouse	Count	1	9	6	3	0	19
		% within Department	5.3%	47.4%	31.6%	15.8%	0.0%	100.0%
		% of Total	1.0%	8.7%	5.8%	2.9%	0.0%	18.3%
Total		Count	12	39	32	20	1	104
		% within Department	11.5%	37.5%	30.8%	19.2%	1.0%	100.0%
		% of Total	11.5%	37.5%	30.8%	19.2%	1.0%	100.0%

Missing Data Test

ISSN: 2716-3865 (Print), 2721-1290 (Online)

Test *Missing* The data aims to analyze and identify the existence of missing data in the survey conducted. This process is very important to ensure data quality and reliability of the analysis conducted . From this missing data test, missing data will also be identified both randomly and structured. *Missing* data that is not handled properly will certainly determine the results of the survey itself. In table 5.4 below , it is known that the survey results show that there is no missing information because all the data is complete, namely from 104 respondents and the data is also validated when detailed into several parts of the *missing* data test seen from the aspect of the Department of work according to table 5.5, age according to table 5.6, Education level according to table 5.7, Job position according to table 5.8 and Work experience according to table 5.9.

Table 4. *Missing test* data using the *IBM SPSS Statistics application*

Statistics						
		Department where you work	How many your age ?	What is the level education highest you have completed ?	What is the position ? You in place Work ?	Already how long experience You work in a company This ?
N	Valid	104	104	104	104	104
	Missing	0	0	0	0	0

Table 5. Missing data test based on the department of work using the *IBM SPSS Statistics application*

Department where you work					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Administration and Support team	5	4.8	4.8	4.8
	Environmental Health and Safety	4	3.8	3.8	8.7
	Laboratory	8	7.7	7.7	16.3
	Etc	4	3.8	3.8	20.2
	Maintenance	16	15.4	15.4	35.6
	Production	33	31.7	31.7	67.3
	Project	1	1.0	1.0	68.3
	Sales and Commercial	14	13.5	13.5	81.7
	Warehouse	19	18.3	18.3	100.0
	Total	**104**	**100.0**	**100.0**	

Table 6. *Missing test data based on age using IBM SPSS Statistics* application

How many your age					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	> 55	1	1.0	1.0	1.0
	26 - 35	10	9.6	9.6	10.6
	36 - 45	61	58.7	58.7	69.2
	46 - 55	32	30.8	30.8	100.0
	Total	**104**	**100.0**	**100.0**	

Table 7. *Missing test data based on age using IBM SPSS Statistics* application

ISSN: 2716-3865 (Print), 2721-1290 (Online)

What is the level education the highest you have completed					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Associate	5	4.8	4.8	4.8
	Master's degree	3	2.9	2.9	7.7
	Bachelor's degree	46	44.2	44.2	51.9
	School Upper Middle School	48	46.2	46.2	98.1
	School Intermediate First	2	1.9	1.9	100.0
	Total	**104**	**100.0**	**100.0**	

Table 8. *Missing test* data based on position or job title using the *IBM SPSS Statistics application*

What is the position ? You in place Work					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Manager	20	19.2	19.2	19.2
	Foreman	17	16.3	16.3	35.6
	Operator	33	31.7	31.7	67.3
	Supervisor	22	21.2	21.2	88.5
	Technician	12	11.5	11.5	100.0
	Total	**104**	**100.0**	**100.0**	

Table 9. *Missing test* data based on experience working using the *IBM SPSS Statistics application*

Already how long experience You work in a company This					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	>1 year - 5 years	12	11.5	11.5	11.5
	>10 years - 15 years	32	30.8	30.8	42.3
	>15 years - 20 years	20	19.2	19.2	61.5
	>25 years	1	1.0	1.0	62.5
	>5 years - 10 years	39	37.5	37.5	100.0
	Total	104	100.0	100.0	

Descriptive Test Statistics Data

Descriptive Statistic data tests are conducted to analyze and present the main characteristics of the collected data in a concise and clear manner. The main purpose is to provide an overview of the data without making inferences or comparisons between groups. Descriptive tests include steps used to describe or summarize data, such as frequency distribution, measures of central tendency, and measures of spread in the survey conducted.

Sum, Mean , Median, Mode, Variance, standard deviation, and standard error

In this section will be explained with descriptive statistical analysis on the research variables that have been determined. From the analysis will be presented summarized data such as

ISSN: 2716-3865 (Print), 2721-1290 (Online)

average, median and mode so as to provide an overview of the variables to be analyzed, and can identify patterns or trends of the data presented so as to show the majority of respondents who have certain preferences or consistent distribution of demographic characteristics

Safety Leadership or Leadership

The survey variables conducted related to *Safety Leadership* consist of 12 questions viewed from several dimensions, namely the commitment of company leaders in implementing safety programs and *Human and Organizational Performance (HOP) programs,* involvement in programs such as *inspections*, *meetings* and involvement in reporting accidents in the workplace and building worker capabilities in carrying out daily activities by implementing safety aspects. The results of the descriptive analysis for *the Safety Leadership Variable* in table 4.4.13 above illustrates that overall the respondents of the study agreed that everyone has the potential to experience an incident or work accident as described in the LP9 indicator where the average value is 4,634, this is very much in accordance with the HOP concept, namely *people make mistakes* and *human error* is one of the biggest contributors to accidents in the workplace. In line with the answers of the respondents who mostly agreed regarding questions related to the importance of the involvement of company leaders in the LP2 indicator where the average value obtained was 4,423 where *Line supervisors* and top management showed a high commitment to safety programs and *Human and Organizational Performance (HOP)* in the workplace. Line supervisors and top management showed a high commitment to safety programs in the workplace. When viewed from the standard error value, it shows that none is more than 1 so that all participating samples can represent the entire population. The efforts made by the Leadership team in implementing occupational safety and health programs and HOP certainly greatly affect the results of this survey.

Training Program

Survey variables conducted *related* to *training programs* consists of 8 questions viewed from several dimensions, namely the company has prepared a training program related to the safety program and the *Human and Organizational Performance (HOP) program,* Worker involvement in the *training program* will also be a concern in this analysis including whether the program can support daily work. The results of the descriptive analysis for *the Training Program Variable* or Training in table 5.12 above illustrates that overall the respondents of the study agreed that the company has had an appropriate training program and this is a company priority for workers according to Indicator TR7, it was found that the average value is 3.67. Training programs related to Human and Organizational Performance (HOP) have also become part of what is run by the company to build worker competency so that they can work more safely, also reflected in TR1 with an average value of 3,769. When viewed from the standard error value, it shows that none is more than 1 so that all participating samples can represent the entire population. The efforts made by the Leadership team in running the occupational safety and health program and HOP certainly greatly affect the results of this survey.

Communication Program

Survey variables conducted related to the *Communication Program* consists of 11 questions that are viewed from several dimensions, namely the company has prepared a clear communication program related to the safety program and the *Human and Organizational Performance (HOP),* such as the availability of easily accessible information regarding these programs and an understanding of the use of *tools*. *HOPs* that have been implemented by companies such as *verbalize point touch, am i ready checklist, pre job danger analysis form,* and *incident investigation tools* . The results of the descriptive analysis for the *Communication Program variable* in table 5.13 above illustrates that overall the research respondents agreed

ISSN: 2716-3865 (Print), 2721-1290 (Online)

that the company has communicated that occupational safety and health are the most important things in running the company's business according to the CA7 Indicator, it was found that the average value was 4.4615. On the other hand, understanding related to *Human and Organizational Performance (HOP) tools* in the CA9 indicator needs to be a concern for the company because the average value is 2.8269. Respondents answer agree with 25% (26 respondents) Agree), 32 % (44 respondents) neutral), 44% (45 respondents) No agree). This is show that majority employee Not yet too familiar related with *tools* used in the Company's HOP program especially matter This contributed by 43% (41 people) of employees who work as *frontliners* such as operators and mechanics who answer neutral , no agree and strongly disagree agree . When viewed from the standard error value shows that none is more than 1 so that all participating samples can represent the entire population. The efforts made by *the Leadership team* in implementing the occupational safety and health program and HOP certainly greatly affect the results of this survey.

Incident Management Program

The survey variables conducted related to *Incident Management* consist of 15 questions viewed from several dimensions, namely the company has prepared an existing incident management program, incident reporting including *unsafe acts, unsafe conditions, nearmisses* and *accidents* in the workplace. This also includes assessing whether the *Human and Organizational Performance (HOP*) concept has become part of decision making or determining the root cause of an accident and the impact received by workers if they experience a work accident.

The results of the descriptive analysis for *the Incident Management Program variable* in table 14 illustrate that overall the research respondents agreed that *human error* is the most dominant aspect in the occurrence of a work accident and this is one of the focuses in the *Human and Organizational Performance (HOP) program* and this is reflected in the IM11 indicator with an average value of 4.4808. and the survey results are also supported by data showing that the company is very serious in implementing programs to eliminate work accidents according to the IM1 indicator with an average value of 4.2404 and the company also has containers and means For Can report incident on the spot work depicted on the IM2 indicator with average value of 4.2212. When viewed from the standard error value, it shows that the data on IM6 and IM12 are >1 and this can still be considered reasonable because after using the One-sample Kolmogorov-Smirnov test, it was found that the standard deviation was 1.

Risk Management Program

The survey variables conducted related to *Risk Management* consist of 10 questions viewed from several dimensions, namely the company has conducted a risk assessment program, and has determined controls to reduce risks in the workplace. This includes assessing whether the *Human and Organizational Performance (HOP*) concept has become part of the risk assessment program and the creation of *company operational standards (SOP) and risk assessment* .

The results of the descriptive analysis for the *risk management program variable* are in table 5.16. illustrates that overall the respondents of the study agreed that the company has a priority related to handling high-risk work according to the MR10 indicator with an average of 4.4615. This is also supported by the majority response that they have the right to stop work that is not in accordance with *the standard operational procedure (SOP)* and risk *assessment* available according to the HOP concept according to the MR6 indicator with an average value of 4.2404 . When viewed from the standard error value, it shows that none is more than 1 so that all participating samples can represent the entire population. The efforts made by *the*

ISSN: 2716-3865 (Print), 2721-1290 (Online)

Leadership team in implementing the occupational safety and health program and HOP certainly greatly affect the results of this survey.

Linearity Test

Linearity Test aiming For see are two variables own a significant linear relationship or no . Good correlation will show there is linear relationship between predictor or independent variable (x) with variable criterion or dependent (y). basis taking decision is compare mark significance (Sig.) with 0.05. If the Linearity Sig. value is <0.05 then There is significant linear relationship between independent variable with dependent variable on the other hand if Sig.<0.05 then No there is linear relationship significant.

Table 10. Linearity Test use IBM SPSS 29 application

ANOVA Table							
			Sum of Squares	df	Mean Square	F	Sig.
LEADERSHIP * TRAINING PROGRAM	Between Groups	(Combined)	681,590	15	45,439	7,857	0,000
		Linearity	455,105	1	455,105	78,692	0,000
		Deviation from Linearity	226,485	14	16,177	2,797	0.002
	Within Groups		508,939	88	5,783		
	Total		1190,529	103			
ANOVA Table							
			Sum of Squares	df	Mean Square	F	Sig.
LEADERSHIP * COMMUNICATION PROGRAM	Between Groups	(Combined)	803,708	17	47,277	10,511	0,000
		Linearity	635,200	1	635,200	141,221	0,000
		Deviation from Linearity	168,508	16	10,532	2,341	0.006
	Within Groups		386,821	86	4,498		
	Total		1190,529	103			
ANOVA Table							
			Sum of Squares	df	Mean Square	F	Sig.
LEADERSHIP * INCIDENT MANAGEMENT	Between Groups	(Combined)	703,239	18	39,069	6,815	0,000
		Linearity	495,652	1	495,652	86,459	0,000
		Deviation from Linearity	207,587	17	12,211	2,130	0.012
	Within Groups		487,290	85	5,733		
	Total		1190,529	103			
ANOVA Table							
			Sum of Squares	df	Mean Square	F	Sig.
LEADERSHIP * RISK MANAGEMENT	Between Groups	(Combined)	754,569	16	47,161	9,411	0,000
		Linearity	581,446	1	581,446	116,033	0,000
		Dev from Linearity	173,123	15	11,542	2,303	0.008
	Within Groups		435,960	87	5,011		
	Total		1190,529	103			

From the results of Linearity Analysis on found that factor *Leadership* has linear relationship significant and highly relevant with variable other in the survey , thing This proven Where linearity test results *Leadership* with *training* program is 0.000, linearity test *Leadership* with communication program is 0.000, linearity test *Leadership* with *training* program is 0.000,

ISSN: 2716-3865 (Print), 2721-1290 (Online)

linearity test *Leadership* with management the program incident is 0.000, and the linearity test *Leadership* with management risk is 0.000.

Validity test and reliability test

Validity test and reliability test in survey is aiming For ensure that instrument survey used in A study or data collection can measure with correct and consistent so that capable increase credibility and accuracy in A survey . Testing validity can done with compare results R- count measurement *(Pearson Correlations)* with R- table value (Sugiono, 2015). If the calculated R- value show mark results more big from R- table then the research instrument is valid and legitimate , but If otherwise R- count its value more small from R- table then the research instrument the invalid or No legitimate so that the data comes from from study the must thrown away . With amount respondents 104 people then found df = n-2 which is 0.1927 (see attachment) for R- table).

Df = distribution factor (0.05)

N = number respondents .

From the data in table 4.4.19 it can be seen that concluded that all survey parameters used are valid because the R- table obtained more big from R- count namely > 0.1297. From the data in table 4.4.20 above can concluded that all survey parameters used are valid because the R- table obtained more big from R- count namely > 0.1297 except for the TR1 indicator where the R- table more small compared to R- count . For in the future this data need to be reviewed again if want to used as a parameter in do survey with scale respondents and the same questions . From the data in table 4.4.21 above can concluded that all survey parameters used are valid because the R- table obtained more big from R- count namely > 0.1297 except for indicators CA4, CA6 and CA7 where the R- table more small compared to R- count . For in the future this data need to be reviewed again If want to used as a parameter in do survey with scale respondents and the same questions . From the data in table 4.4.21 above can concluded that all survey parameters used are valid because the R- table obtained more big from R- count that is > 0.1297 except IM11 indicator where R- table more small compared to R- count . For in the future this data need to be reviewed again If want to used as a parameter in do survey with scale respondents and the same questions . From the data in table 4.4.19 it can be concluded that all survey parameters used are valid because the R- table obtained more big from R- count which is > 0.1297.

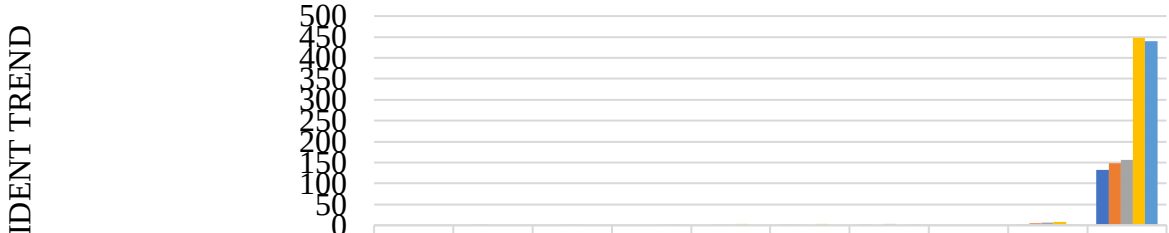
Testing the Effect of HOP Implementation when compared to the number of accident reports in the workplace.

Testing to impact Implementation of Human and Organizational Performance (HOP) in companies is also necessary done For see how much effective influence from this program after being implemented in business *Animal, Nutrition and Health* starting in the month February 2022 to by October 2024 to Company performance especially the impact to report accident work and reports incident almost accident.

In the picture Figure 5.3.6. Report accident work and reports incident almost the misfortune that is in place work . We can see that before implementation *Human and Organizational performance (HOP)* during the period In 2020 there were 2 cases accidents (1 *Property damage Incident* and 1 *Process Safety Incident*) and in 2021 there were 5 accidents (1 *lost time incident* , 2 *first aid incidents* and 2 *safety incident process).* And at the time start For introducing the HOP program in 2022 is available decline level severity case accident that has an impact direct to worker namely 1 case *restricted work case* , 1 case *first aid* . When the program is implemented and implemented in all location looks influence a very significant decline in 2023 against level severity and amount incidents that have an impact direct to

ISSN: 2716-3865 (Print), 2721-1290 (Online)

worker that is 1 case *medical treatment* and 4 cases of first *aid incidents* even in 2024 until period October 2024 Company succeed reduce accident rate become only 1 case *medical treatment* that has an impact direct to employees . On the other hand , if seen from aspect involvement employees inside lower accident through the reporting program incident almost wretched , condition No safe and also behavior No safe also very visible with clear changes that occur at the time before the HOP program was implemented and after implemented . Figure 5.3.6 shows that before implementation of HOP report *near miss* , *unsafe condition, unsafe act* in the Company in 2020 there were 132 reports , and in 2021 there were 148 reports , of course matter this is very different After the Company implemented the HOP program , namely in 2022 , there were improvement report to 157 reports and very significant in 2023 , namely 448 reports and in 2024 until October 2024 is already There are 440 reports .



	Fatality	Lost Time	Restricted Work Case	Medical Treatment	First Aid	Property Damage	Process Safety Incident	Environment Incident	Jumlah Kecelakaan	Near miss / Unsafe Condition/ Unsafe Act
1 January - 31 December 2020						1	1	0	2	132
1 January - 31 December 2021		1			2	2		0	5	148
1 January - 31 December 2022			1		1		4	0	6	157
1 January - 31 December 2023				1	4	3		0	8	448
1 January - 31 December 2024				1			1	0	2	440

Figure 1. Report accident work and reports incident almost the misfortune that is in place Work .

From the trend This Can concluded that HOP implementation can increase awareness employee For involved in report events almost wretched , condition No safe , behavior No safe at Company Locations and can also strengthen survey data previously said that that the Company has prepare receptacle For reporting accidents and incidents almost woe at the company as well as Can validate statement related to the Company has very high commitment in the handle every report incidents reported by workers through system reporting *Enablon (*

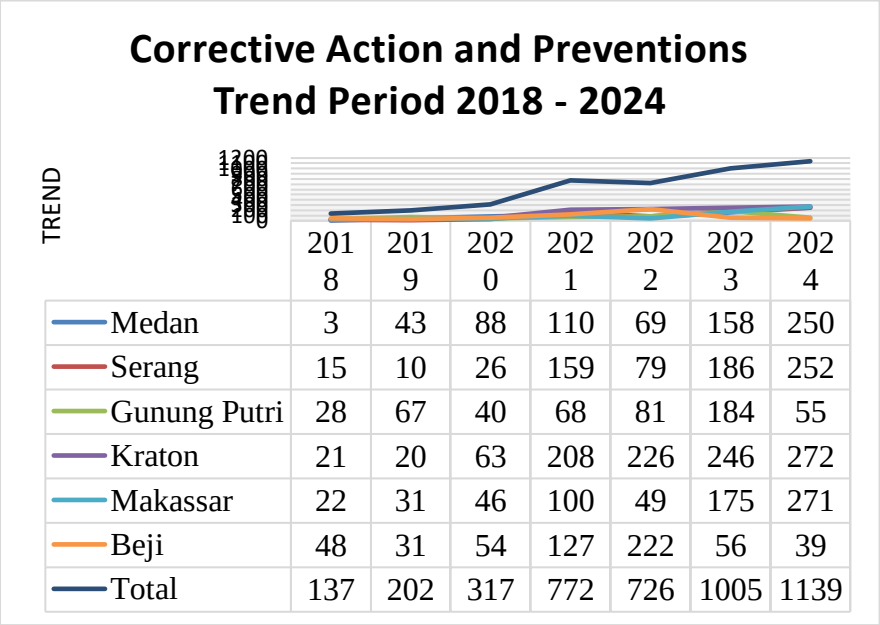
ISSN: 2716-3865 (Print), 2721-1290 (Online)

see attachment 1.7). as well as also strengthen the influence No do *blaming* as one of the important pillars in HOP implementation when the occurrence incident on the spot work that results in worker brave report every *near miss , unsafe condition and unsafe act* in place Work without existence sanctions and impact on the number reports that increased significantly in 2023 and 2024.

Testing the Effect of HOP Implementation when compared to the number of corrective and preventive actions taken by the company.

Testing to impact The implementation of Human and Organizational Performance (HOP) in companies has also done For see how much effective influence from this program after being implemented in business *Animal, Nutrition and Health* starting in the month February 2022 to by October 2024 to Company performance especially the impact to amount report repairs and also the amount prevention as act further action taken company as very positive response For remove potential danger and risk accident on the spot Work .

In the picture Figure 5.3.7. Company's corrective action and preventive action report . From this trend Can concluded that before HOP implementation implementation *corrective action* and *preventive action* in 2020 and 2021 reached 317 and 772 reports respectively , and after implementation of HOP in 2023 and 2024 amount report repair and prevention increased to 1005 and 1139 reports and improvements made respectively in accordance observation writer based on results from evaluation *root cause analysis* so that reduce potential the same risks and deviations happen later day . The author also concluded that company own very high commitment in the handle every report incidents reported by workers through system reporting *Enablon (see attachment 1.8)* and ensure all necessary actions are also taken as well as noted in the comprehensive system . as well as also strengthen the results data survey previously stated that company through team *leadership* own high commitment For reduce accident in place Work through action repairs and prevention carried out .



	2018	2019	2020	2021	2022	2023	2024
Medan	3	43	88	110	69	158	250
Serang	15	10	26	159	79	186	252
Gunung Putri	28	67	40	68	81	184	55
Kraton	21	20	63	208	226	246	272
Makassar	22	31	46	100	49	175	271
Beji	48	31	54	127	222	56	39
Total	137	202	317	772	726	1005	1139

Figure 2. Report corrective action and preventive action taken by the company to all report from worker

Conclusion

The study concludes that the Human and Organizational Performance (HOP) program significantly influences occupational safety and health culture within the company. Key elements such as leadership, training, communication, incident management, and risk

ISSN: 2716-3865 (Print), 2721-1290 (Online)

management play integral roles in reducing workplace accidents. However, the program currently focuses on managerial and supervisory levels, with limited reach to frontline employees like operators and technicians who face daily work risks. Training programs, including Training Need Analysis and refresher courses, need better organization and broader scope to enhance their effectiveness and address employee perceptions of inadequacy. Communication and incident management are critical factors for improving the HOP maturity level. Challenges include limited access to HOP guidelines, inadequate signage, and minimal employee feedback mechanisms. A persistent "blame culture" discourages reporting of near-misses or unsafe acts, counteracting HOP principles. Additionally, incident investigations often exclude HOP elements, with training for such investigations confined to supervisory levels. Expanding training and involvement to all employee levels, particularly operators and technicians, is essential for fostering a mature safety culture and effective risk management.

References

Aydin, M., Camliyurt, G., Akyuz, E., & Arslan, O. (2021). Analyzing human error contributions to maritime environmental risk in oil/chemical tanker ship. *Human and Ecological Risk Assessment: An International Journal*, *27*(7), 1838-1859. http://dx.doi.org/10.1080/10807039.2021.1910011

Cheong Yong, Y., & Emma Mustaffa, N. (2012). Analysis of factors critical to construction project success in Malaysia. *Engineering, construction and architectural management*, *19*(5), 543-556. http://dx.doi.org/10.1108/09699981211259612

Denison, D. R. (1996). What is the difference between organizational culture and organizational climate? A native's point of view on a decade of paradigm wars. *Academy of management review*, *21*(3), 619-654. http://dx.doi.org/10.5465/AMR.1996.9702100310

Grabowski, M., & Roberts, K. H. (1996). Human and organizational error in large scale systems. *IEEE Transactions on Systems, Man, and Cybernetics-Part A: Systems and Humans*, *26*(1), 2-16. https://doi.org/10.1109/3468.477856

Griffin, M. A., & Curcuruto, M. (2016). Safety climate in organizations. *Annual review of organizational psychology and organizational behavior*, *3*(1), 191-212. http://dx.doi.org/10.1146/annurev-orgpsych-041015-062414

Hunt, C. B., & Auster, E. R. (1990). Proactive environmental management: avoiding the toxic trap. *MIT Sloan Management Review*, *31*(2), 7.

Kayes, D. C. (2015). *Organizational resilience: How learning sustains organizations in crisis, disaster, and breakdown*. Oxford University Press, USA.

Kim, Y. G., Kim, A. R., Kim, J. H., & Seong, P. H. (2018). Approach for safety culture evaluation under accident situation at NPPs; an exploratory study using case studies. *Annals of Nuclear Energy*, *121*, 305-315. http://dx.doi.org/10.1016/j.anucene.2018.07.028

Kohn, J. P., Friend, M. A., Friend, M., & Kohn, J. (2023). *Fundamentals of occupational safety and health*. Rowman & Littlefield.

Krzywdzinski, M. (2017). Automation, skill requirements and labour-use strategies: high-wage and low-wage approaches to high-tech manufacturing in the automotive industry. *New technology, work and employment*, *32*(3), 247-267. https://doi.org/10.1111/ntwe.12100

Liu, X., Huang, G., Huang, H., Wang, S., Xiao, Y., & Chen, W. (2015). Safety climate, safety behavior, and worker injuries in the Chinese manufacturing industry. *Safety science*, *78*, 173-178. https://psycnet.apa.org/doi/10.1016/j.ssci.2015.04.023

ISSN: 2716-3865 (Print), 2721-1290 (Online)

Lyons, M., Adams, S., Woloshynowych, M., & Vincent, C. (2004). Human reliability analysis in healthcare: a review of techniques. *International Journal of Risk & Safety in Medicine*, *16*(4), 223-237. http://dx.doi.org/10.3233/JRS-2004-321

Man, S. S., Chan, A. H. S., Alabdulkarim, S., & Zhang, T. (2021). The effect of personal and organizational factors on the risk-taking behavior of Hong Kong construction workers. *Safety science*, *136*, 105155. https://doi.org/10.1016/j.ssci.2020.105155

Mohammadfam, I., Ghasemi, F., Kalatpour, O., & Moghimbeigi, A. (2017). Constructing a Bayesian network model for improving safety behavior of employees at workplaces. *Applied ergonomics*, *58*, 35-47. https://doi.org/10.1016/j.apergo.2016.05.006

O'Reilly III, C. A., Chatman, J., & Caldwell, D. F. (1991). People and organizational culture: A profile comparison approach to assessing person-organization fit. *Academy of management journal*, *34*(3), 487-516. http://dx.doi.org/10.2307/256404

Pandey, A., Gupta, R. K., & Arora, A. P. (2009). Spiritual climate of business organizations and its impact on customers' experience. *Journal of business ethics*, *88*, 313-332. https://doi.org/10.1007/s10551-008-9965-z

Roberts, K. H., & Bea, R. (2001). Must accidents happen? Lessons from high-reliability organizations. *Academy of Management Perspectives*, *15*(3), 70-78. http://dx.doi.org/10.5465/AME.2001.5229613

Schöbel, M., Silla, I., Teperi, A. M., Gustafsson, R., Piirto, A., Rollenhagen, C., & Wahlström, B. (2022). Human and organizational factors in European nuclear safety: A fifty-year perspective on insights, implementations, and ways forward. *Energy Research & Social Science*, *85*, 102378. https://doi.org/10.1016/j.erss.2021.102378

Schwatka, N. V., & Rosecrance, J. C. (2016). Safety climate and safety behaviors in the construction industry: The importance of co-workers commitment to safety. *Work*, *54*(2), 401-413. https://psycnet.apa.org/doi/10.3233/WOR-162341

Shuen, Y. S., & Wahab, S. R. A. (2016). The mediating effect of safety culture on safety communication and human factor accident at the workplace. *Asian Soc Sci*, *12*(12), 127-142. http://dx.doi.org/10.5539/ass.v12n12p127

Siuta, D., Kukfisz, B., Kuczyńska, A., & Mitkowski, P. T. (2022). Methodology for the determination of a process safety culture index and safety culture maturity level in industries. *International journal of environmental research and public health*, *19*(5), 2668. https://doi.org/10.3390/ijerph19052668

Stranks, J. (2007). *Human factors and behavioural safety*. Routledge.

Wood, A. J., Wollenberg, B. F., & Sheblé, G. B. (2013). *Power generation, operation, and control*. John Wiley & Sons.

Xue, Y., & Fu, G. (2018). A modified accident analysis and investigation model for the general aviation industry: Emphasizing on human and organizational factors. *Journal of safety research*, *67*, 1-15. https://doi.org/10.1016/j.jsr.2018.09.008

ISSN: 2716-3865 (Print), 2721-1290 (Online)