

Toward Health, Safety, Security, & Environment (HSSE) Integration into Business Sustainability of Marine, Shipping, & Logistics Companies in Indonesia

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Abstract

Awareness to consider HSSE in business operations becomes one of the approaches in sustaining the business of the integrated marine logistics sector. It is because the impact of unmanaged HSSE risk could have significant direct consequences for business in terms of financial & reputation loss. Thus, most companies believe, a proper HSSE management would drive the company's performance and sustain the business. Unfortunately, integrating HSSE into business is not an easy task. There are so many HSSE standards that need to be covered besides other standards that need to be also implemented from many disciplinary aspects. Therefore, the research conducted to identify an HSSE management system that aligns with business sustainability as an integrated management system to provide simplicity, eliminate redundancies, reduce documentation, establish consistency, reduce bureaucracy, cost reduction, streamline processes, optimize resources, consistency objectives across multiple systems, deliver a better result, and gain competitive advantage in supporting to be lean enterprise in driving company to be world-class level. The framework used is ESG by Sustainalytics, which consider three main items, e.g., corporate governance, materiality issues, and idiosyncratic issues. Corporate governance refers to the worldwide standard such as standalone management systems (ISO 14001, ISO 45001, ISM, ISPS, and ANZI Z10) and integrated management systems (PAS 99, ISRS 9, OEMS, and SUPREME). Materiality issues refer to the Sustainalytics and SASB list out. Meanwhile, the idiosyncratic refers to GISIS, IMO data of incidents in the last 5 years. In addition to that, research enriched with a causal effect model in enhancing HSSE excellence. The result of the assessment is a proposed integrated management system categorized into four pillars, i.e., People, Process, Plant, and Performance (4Ps). People consist of Leadership commitment and Training & competency assurance. Process consists of Occupational Health, Safe operation, Security for personnel & asset, Environment management, Hazard & risk management, Compliance, Emergency Management, Contractor & supplier management, Project management, Communication & promotion, and Learning from the event. Plant consists of Reliability & integrity management and Management of change. Performance consists of Result & reviews.

Keywords: *Business Sustainability; Integrated Management System; Logistic; Maritime; Shipping*



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INTRODUCTION

Nowadays, Health, Safety, Security, and Environment (HSSE) have become critical issues in a company's business. It's a matter of avoiding the cost, especially regarding major accident hazards such as loss of life, major oil spills, explosions, major fires, property damages, etc. It also influences the company image or reputation in how well dealing with HSSE risk. Stakeholders would be highly

concerned if there were an HSSE incident and take negative credit to the company. Thus, most companies believe proper HSSE management would drive the company's performance to go better, and it would support sustaining business operations. Several research studies have been conducted to solve how to integrate HSSE into a business context. The previous study suggests the concept of Social Business (Weitner, 2013), Integrated Management System (Kruse, 2019), and Operation Excellence Management System/OEMS (Lutchman, 2020). Overall, the idea is to make HSSE part of the business process in terms of business planning, operational activities, performance monitoring, and business evaluation.

The research purpose is to identify the HSSE management system component that aligns with business sustainability efforts as an integrated management system that focuses on Environment, Social, & Government (ESG). The research scope is integrated marine logistics business in Indonesia, which covers shipping services, marine services, and logistics, as the baseline study is PT Pertamina Trans Kontinental (PTK). Thus, the framework used in integration is ESG by Sustainalytics. It's consisted of corporate governance, materiality issues, and idiosyncratic issues related to its industry sector to capture the three world's emerging issues today, which are Environment, Social, & Government (ESG).

LITERATURE REVIEW

Weitner (2013) stated that "historically, HSE programs have been based on reactive, compliance-driven, prescriptive actions and evolved from either incident that caused injury and death or extensive environmental damage in which government agencies responded with command-and-control based regulations. This required companies to establish policies and programs that ensured compliance to these regulations." Other research conducted by Kruse (2019) concluded that "Organizations can protect workers, the environment, and simultaneously contribute to lean management principles by implementing integrated management systems requiring joint management that allow for the shared design, evaluation, and continuous improvement of environmental, safety, and health practices that are compatible with the lean enterprise movement in today's high-performance driven organizations." Aligned with two previous conclusions is the operational excellence approach which is defined as "A philosophy of the workplace where problem-solving, teamwork, and leadership results in the continuous improvement of an organization. The process involves focusing on the customers' needs, keeping the employees positive and empowered, and continually improving the current activities in the workplace" (Markle, 2022). Another framework that might be used is the three bottom lines which consist of Economic, Environment, & Social, called sustainability (Psarftis, 2019 & Wang: 2020). The HSSE would be embedded as the most components in those bottom lines focusing on Social (especially for the employee's health & safety) and Environment. Today, industrial leaders understand that failures in HSSE management pose direct impacts on business sustainability. Thus, sustainability which also covers HSSE management practices, should not be intended as an overhead/operational cost that makes the business unfeasible. Further study concluded by Bob Willard in 2012 mentioned that "sustainability could improve profit by at least 51%-81% within 3-5 years while avoiding a potential 16%-36% erosion of profit if it did nothing.

One of the emerging approaches in integrating HSSE into business is called ESG (Environmental, Social, & Governance). ESG is a standard that is being used by most of the

stakeholders as non-financial performance indicators which have a material impact on the long-term risk and return on investment. A strong ESG proposition can create value (McKinsey, 2019). ESG focuses on three dimensions:

1. Environmental criterion considers how companies use energy and manage their environmental impact, such as energy efficiency, climate change, carbon emissions, biodiversity, air & water quality, deforestation, waste management, etc.
2. Social criterion examines how a company fosters its people and culture and how that has ripple effects on the broader community. Factors considered are inclusivity, gender and diversity, employee engagement, occupational health & safety, customer satisfaction, data protection, privacy, community relations, human rights, and labor standards.
3. Governance considers a company's internal system of controls, practices, and procedures and how an organization stays ahead of violations. It ensures transparency and industry best practices and includes dialogue with regulators. Factors considered are the company's leadership, board composition, executive compensation, audit committee structure, internal controls and shareholder rights, bribery and corruption, lobbying, political contributions, and whistleblower programs.

One of the most used ESG frameworks worldwide is described by Sustainalytics (2021), as depicted in Figure 1. Corporate governance is a foundational element that reflects poses a material risk for companies. On average, unmanaged corporate governance risk contributes around about 20% to the overall unmanaged risk score. Material ESG issues are focused on a topic, or set of related topics, that require a common set of management initiatives or a similar type of oversight. Meanwhile, Idiosyncratic Issues are 'unpredictable' or unexpected in the sense that they are unrelated to the specific subindustry and the business models that can be found in that subindustry. The use of the Sustainalytics framework for this research with some considerations as follows:

1. The rating of Sustainalytics has been used by the Indonesian Stock Exchange (IDX).
2. Emerging tool that has been used in most corporations worldwide in recent years.
3. ESG represents a performance indicator that assists in boosting business excellence by combining all three critical aspects of Environment, Social, & Governance with business strategies.
4. Provide the same language & understanding in all related stakeholder perspectives from investors, consumers, NGOs, government, suppliers, and contractors.
5. ESG also embraces the previous framework of Three Bottom Lines (Sustainability).

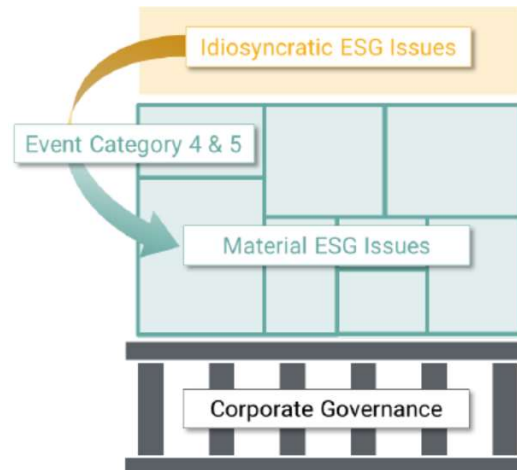


Figure 1. Three Building Blocks of ESG Risk Ratings

RESEARCH METHOD

This research methodology was conducted with seven steps as follows.

1. Analysis of the business context of Pertamina Trans Kontinental (PTK) as the baseline of the study to understand the business process, strategy, industrial issues & trends, organization culture, scope, and industry objectives. It gives some comprehensive insight at a high level on what needs to be managed and faced in the future.
2. Identify the best practices in the governance of integrated management systems referring to worldwide standalone & integrated management systems. The focus is to identify the grouping of a process system that is commonly incorporated into the integrated management system.
3. Identify the materiality issues. Materiality issues are some related potential risks topic that needs to be managed appropriately based on the literature review.
4. Identify idiosyncratic issues based on the HSSE incident record database.
5. Conduct cause-effect model analysis in enhancing HSSE excellence using PT XYZ data as a study case.
6. Proposed integrated management system processes that consider results from steps 2-5.
7. Establish integrated management system processes that fit the integrated marine logistics sector in Indonesia.

The integrated management system is categorized into 4Ps pillars. All seven steps of the methodology are depicted in Figure 2.

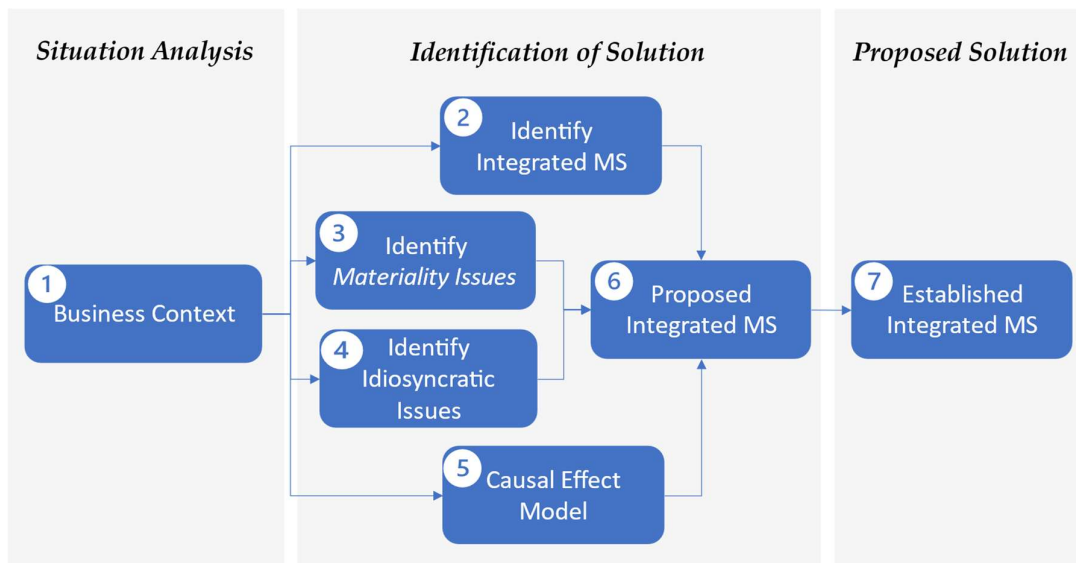


Figure 2. Research Methodology

FINDINGS AND DISCUSSION

The assessment begins with an understanding of the business context of the integrated marine logistics sector in Indonesia as the business operations of Pertamina Trans Kontinental (PTK). It helps understand what factors influence business sustainability. The business context that has been identified covers the operational, scope, line business focus, key success factors, and rivalry, among others, in the industrial sector. According to Porter's Five Force analysis, integrated marine logistics rivalry in Indonesia is moderate. It has a bright business opportunity in shipping, maritime, & logistic. It's predicted stable growth for the next 5 years following the global economic recovery post-pandemic Covid-19 with a Compound Annual Growth Rate (CAGR) of around 3% for the shipping market and for the marine services at around CAGR 4.8%. The government of Indonesia also plans to improve local content (TKDN) in government-related projects in 2021-2025, which targets are 95% in shipping services, 95% in fuel, 35% in offshore survey services, and 80% in Front End Engineering Design (FEED) (PTK, 2021a). The company should develop a strong competitive advantage in differentiating from other competitors, and it could be achieved by executing an operational excellence strategy. It should improve expertise, resource competency, and business compliance to align with the changing market, especially in the current hot issue of the energy transition, decarbonization, and digitalization.

Currently, PTK uses many Management Systems, such as SUPREME (Sustainability Pertamina Expectations for HSSE Management Excellence), Environmental Management System (EMS), Occupational & Health Management System (OHMS), ISM (International Safety Management) Code, and ISPS (International Ship & Port Facility Security) Code. Implementation of all those management systems creates some redundancies, duplication of documentations, and adds bureaucracy steps. These happen since each of the management systems is implemented standalone and not integrated with each other.

As the second step, identify the integrated management system conducted by compiling worldwide standards such as standalone management systems such as ISO 14001 for Environment Management Systems, ISO 45001 for Occupational Health & Safety Management Systems, ISM (International Safety Management) Code, ISPS (International Ship & Port Facility Security) Code, and ANSI Z10 about Occupational Health & Safety Management System. Meanwhile, for the integrated management system, there are PAS (Publicly Available Specification) 99, ISRS (International Sustainability Rating System) Edition 9, and OEMS (Operations Excellence Management System). Specific to OEMS, since there is no one explicit standard and the process of a system may vary from one company to another company, the common processes refer to Lutchman (2020). OEMS defined as an integrated, organized, structured, and disciplined approach to protecting people, the environment, and organizational assets while improving asset integrity, reliability, and business performance. OEMS helps mitigate business operations and enterprise business risks and allows the organization to focus on value maximization for its stakeholders. Refer to Appendix 1 & Appendix 2 for more detail on each Management System.

Integrating all those management systems that have been implemented in PTK would provide simplicity, eliminate redundancies, reduce documentation, establish consistency, reduce bureaucracy, cost reduction, streamline processes, optimize resources, consistency objectives across multiple systems, deliver a better result, and gain competitive advantage in supporting to be lean enterprise in driving company to be world-class level. Its focus is on selected critical process systems that need to be captured based on the materiality aspect. The result from the compilation is a proposed integrated management system that consists of 16 processes system as follows.

Table 1. Proposed Integrated Management System

No.	Proposed Selected Processes	Covered Materiality Issues
1	Leadership commitment	Policy, purpose, values, objectives, strategy, stakeholder engagement
2	Occupational health	Wellness, industrial hygiene
3	Safe operation	Safe work practices
4	Security for personnel & asset	Security management for personnel, ship, & port
5	Environment management	ESHIA, Waste, emission, air quality, effluent, energy conservation, land use, biodiversity
6	Hazard & risk management	Health, Safety, Security, Environment (HSSE), quality, business, & social risk
7	Compliance	Regulatory, code & standard, & permit, security information
8	Reliability & integrity management	Design, inspection, maintenance
9	Management of change	Organization, facility, process, business planning
10	Emergency management	Emergency response plan, Business Continuity Plan
11	Training & competency assurance	Training needs analysis, deliver training, induction, evaluation

No.	Proposed Selected Processes	Covered Materiality Issues
12	Contractor & supplier management	Contractors/suppliers selection, operation, & assurance, logistic
13	Project management	Planning, execution, control, & closeout
14	Communication & promotion	Meeting, joint committee, recognition, campaign, digitalization
15	Learning from events	Reporting, investigation, analysis, sharing, & verification of incidents, learning from success
16	Result & review	Performance monitoring, measurement, analysis, evaluation, audit, & management review

A summary of each management system differentiation is in Table 2.

Table 2. Covered Processes of Each Management System*

No.	Processes	EMS	OHS	ISM	ISPS	ANZI	PAS 99	ISRS9	OEMS	SUPREME
1	Leadership	E	HS	SE	Sc	HS	HSE	HSScE	HSE	HSScE
2	Occupational health	-	H	-	-	H	H	H	H	H
3	Safe operation	-	S	S	-	S	S	S	S	S
4	Security for personnel & asset	-	-	-	Sc	-	-	Sc	-	Sc
5	Environment management	E	-	E	-	-	E	E	E	E
6	Hazard & risk management	E	HS	SE	Sc	HS	HSE	HSScE	HSE	HSScE
7	Compliance	E	HS	SE	Sc	HS	HSE	HSScE	HSE	HSScE
8	Reliability & integrity management	-	-	S	-	-	-	S	S	S
9	Management of change	-	-	-	-	-	-	S	S	S
10	Emergency management	E	HS	SE	Sc	HS	HSE	HSScE	HSE	HSScE
11	Training & competency assurance	E	HS	SE	Sc	HS	HSE	HSScE	HSE	HSScE
12	Contractor & supplier management	-	S	S	-	S	S	S	S	S
13	Project management	-	-	-	-	-	-	S	S	S

No.	Processes	EMS	OHS	ISM	ISPS	ANZI	PAS 99	ISRS9	OEMS	SUPREME
14	Communication & promotion	E	HS	SE	-	HS	HSE	HSScE	HSE	HSScE
15	Learning from events	E	HS	SE	-	HS	HSE	HSScE	HSE	HSScE
16	Result & review	E	HS	SE	Sc	HS	HSE	HSScE	HSE	HSScE
	Overall	56%	69%	75%	44%	69%	75%	100%	94%	100%

Note: * Identified the scope in terms of Health (H), Safety (S), Security (Sc), & Environment (E). Overall status is calculated based on covered H, S, Sc, & E aspects of each Process.

It seems that referring to Table 2, ISRS9 and SUPREME already covered all the proposed Processes. The result of process identification from standalone & integrated management systems gives the analysis below:

1. Different approach at the Process level. SUPREME uses a management cycle similar to PAS 99, so it differentiates the Planning (Process 5) & Implementation (Process 6). Meanwhile, most IMS (ISRS 9 & OEMS) use the Process approach by materiality aspect.
2. SUPREME didn't capture the process level for Compliance, Security, and Environment Management. It has been the process level in most IMS, while SUPREME only captures those in the subprocess and emerges them in risk management. It should be considered to make more detail due to emerging issues of them & criticality to business impact in recent years. Thus, it proposed to add Compliance, Security, & Environment Management in the process level of PTK's Management System.

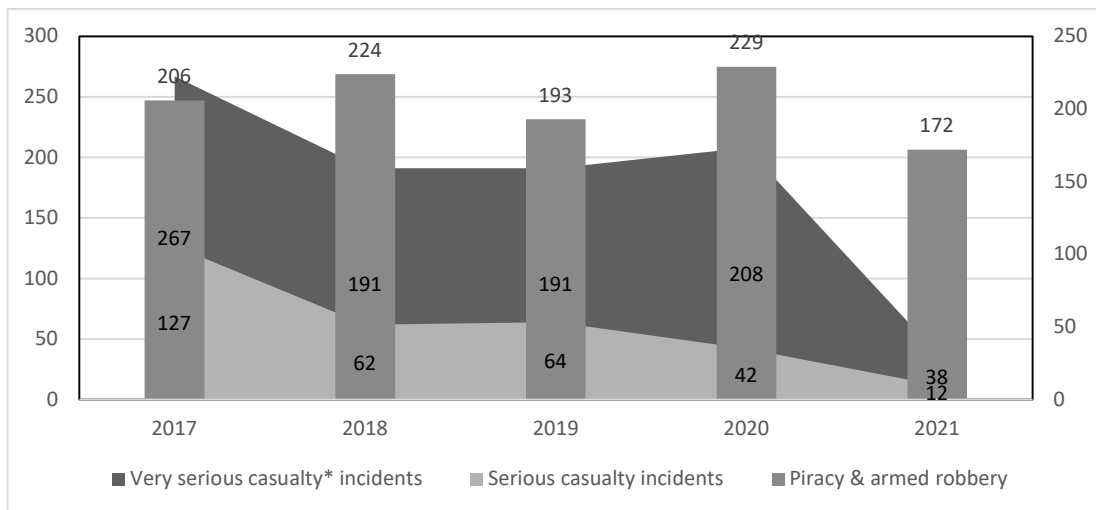
Step three, identify materiality issues; refer to the Sustainability and SASB list out. Sustainability defined materiality issues for the integrated marine logistics sector; there are 13 issues, i.e., (1) business ethics, (2) community relations, (3) emission, effluent, & waste, (4) carbon-own operations, (5) human capital, (6) land use & biodiversity, (7) occupational health & safety, (8) Board/management quality & integrity, (9) Board structure, (10) ownership & shareholders' rights, (11) remuneration, (12) audit & financial reporting, & (13) stakeholder governance. Meanwhile, according to SASB for marine transportation, there are 6 issues, i.e., (1) GHG emissions, (2) air quality, (3) ecological impacts, (4) employee health & safety, (5) business ethics, and (6) accident & safety management. SASB also defines 3 relevant issues for professional & commercial services, i.e., (1) data security, (2) employee engagement, diversity, & inclusion, and (3) business ethics. The materiality issue is directly related to HSSE as follow in Table 2. All those materiality issues would be managed appropriately in HSSE Risk Management according to the related Processes System to avoid impact on the economic value of the company.

Table 3. Materiality Issue & Related Process

No.	Materiality Issues	Related Process
1.	Community relations	Environment management (ESHIA)
2.	Emission, effluent, & waste	Environment management
3.	Carbon - own operations	Environment management
4.	Human capital	Training & competency assurance

No.	Materiality Issues	Related Process
5.	Land use & biodiversity	Environment management
6.	Occupational health & safety	Occupational health and Safe operation
7.	Accident & safety management	Safe operation, Emergency Management, and Learning from events
8.	Data security	Compliance

In step four, idiosyncratic issues were identified using an incident database in the last 5 years from GISIS, IMO. Ref figure 3. The issues involve loss of the ship, loss of life, severe pollution, a fire incident, collision, grounding, contact, heavy weather damage, ice damage, hull cracking, suspected hull defect, piracy & armed robbery, etc. The statistic provides consideration in including some related processes system such as Safe Operation, Emergency Management, Environment Management, Learning from Event, Integrity & Reliability, and Security Management.



Notes:

* Very serious casualties are casualties to ships that involve total loss of the ship, loss of life, or severe pollution

** Serious casualties are casualties to ships that do not qualify as "very serious casualties" and which involve fire, explosion, collision, grounding, contact, heavy weather damage, ice damage, hull cracking, or suspected hull defect, etc.

Figure 3. Recordable Incidents in Marine from 2017-2021

Meanwhile, in step five, causal effect model analysis was conducted to understand the interrelation qualitatively among factors. The cause-effect model was developed by considering external/internal audit documents, the worksheet of management review 2021, and the internal HSSE discussion as the study case at PTK. As a simplification of the model, the analysis of the main factors is categorized into four pillars which are People, Process, Plant, and Performance (4Ps).

Result of the causal effect model as Figure 4. It's identified some main processes that influence achieving HSSE excellence as follows:

1. Commitment and accountability of leadership
2. Qualified & competent of all related personnel in managing HSSE
3. Full cycle of standard process (PDCA) in maintaining the system
4. Asset integrity & reliability to provide safe environment & un-interrupted operations
5. Digitalization of the HSSE process
6. Challenging & maturity in HSSE performance

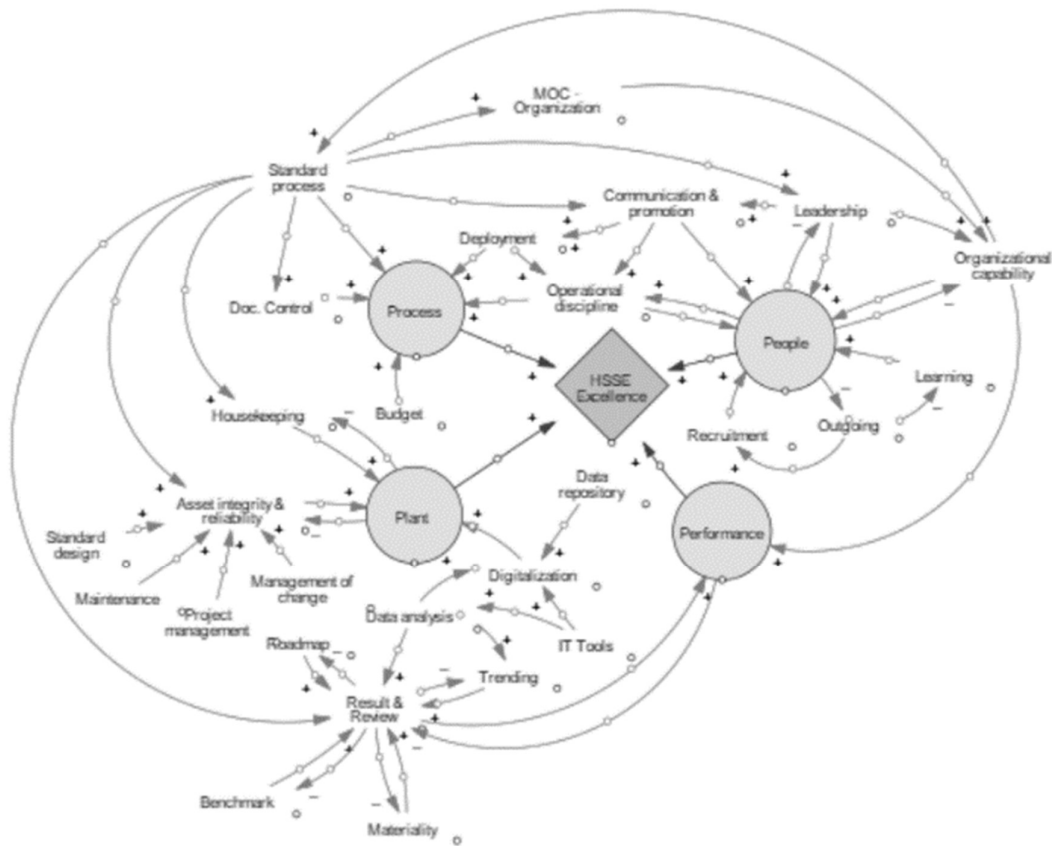


Figure 4. Causal Effect Model in Achieving HSSE Excellence

In step six, the proposed integrated management system from step 2 was tested with other considerations resulting from steps 3, step 4, and step 5 whether all the materiality issues were already captured at the Process system level. It concluded that the proposed integrated management system, as stipulated in Table 1 has covered all the considerations. Finally, the last step is categorizing the proposed integrated management system into 4Ps as follows. Categorization aims to simplify the tracking evaluation and provide a simple visualization dashboard to the Leadership team.

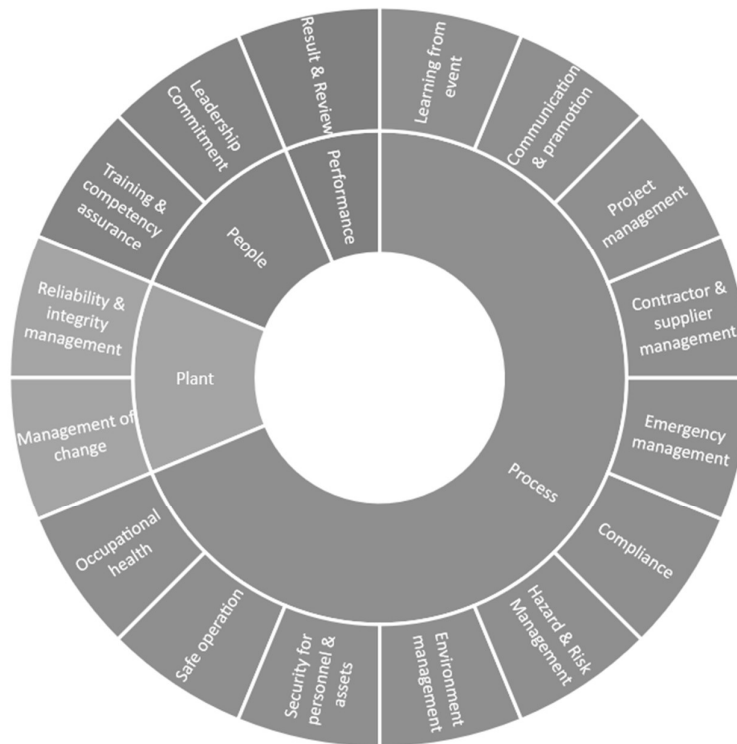


Figure 5. Integrated Management System

CONCLUSION

Understanding the business context of the integrated marine logistics of PTK provides clear operational scope, line business focus, key success factors, and rivalry, among others in the industrial sector. The knowledge of the business context is then used as a baseline reference in further analysis of worldwide standards such as standalone management systems (ISO 14001, ISO 45001, ISM, ISPS, and ANZI Z10) and integrated management systems (PAS 99, ISRS 9, OEMS, and SUPREME). Materiality issues refer to the Sustainability and SASB list out. The idiosyncratic issues refer to GISIS, IMO data of incidents in the last 5 years. In addition to that, the cause-effect model was developed to define the interrelation among factors in enhancing HSSE excellence. The result of the study defined 16 Processes System of an integrated management system that would help PTK achieve lean enterprise and drive the company to be world-class level. All those 16 Processes System then simplify into four categories of pillars which are People, Process, Plant, and Performance (4Ps). People consist of Leadership commitment, and Training & competency assurance. The process consists of Occupational Health, Safe operation, Security for personnel & asset, Environment management, Hazard & risk management, Compliance, Emergency Management, Contractor & supplier management, Project management, Communication & promotion, and Learning from the event. The plant consists of Reliability & integrity management and Management of change. The performance consists of Results & Review.

LIMITATION & FURTHER RESEARCH

The research was conducted by compiling all related aspects of HSSE matters and business sustainability. Interrelated factors are considered qualitatively and do not account for quantitative factors. Further research in considering quantitative data is fully recommended.

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Appendix 1 Scope & Content of Related Standalone Management System

ISO 14001	ISO 45001	ISM Code 2010	ISPS Code 2003	ANSI Z10.0
<ol style="list-style-type: none"> 1. Context of organization 2. Leadership (leadership & commitment, policy, and role, responsibilities & authorities) 3. Planning 4. Support (resources, competence, awareness, communication, and documented information) 5. Operation (planning & control and emergency preparedness & response) 6. Performance evaluation (monitoring, measurement, analysis & evaluation, internal audit, management review) 7. Improvement (nonconformity & corrective action, and continual improvement) 	<ol style="list-style-type: none"> 1. Context of organization 2. Leadership & worker participation 3. Planning 4. Support (resources, competence, awareness, communication, and documented information) 5. Operation (planning & control and emergency preparedness & response) 6. Performance evaluation (monitoring, measurement, analysis & evaluation, internal audit, management review) 7. Improvement (incident, nonconformity & corrective action, and continual improvement) 	<ol style="list-style-type: none"> 1. Safety & Environmental Protection Policy 2. Company Responsibilities and Authority 3. Designated Person(s) 4. Master's Responsibility & Authority 5. Resources & Personnel 6. Shipboard Operation 7. Emergency Preparedness 8. Report & Analysis of Non-Conformities, Accidents, & Hazardous Occurrences 9. Maintenance of the Ship & Equipment 10. Documentation 11. Company Verification, Review, & Evaluation 12. Certification & Periodical Verification 13. Interim Certification 14. Verification 	<ol style="list-style-type: none"> 1. Responsibilities of Contracting Governments 2. Declaration of Security 3. Obligations of the Company 4. Ship Security 5. Ship Security Assessment 6. Ship Security Plan 7. Records 8. Company Security Officer 9. Ship Security Officer 10. Training, Drills, and Exercises on Ship Security 11. Port Facility Security 12. Port Facility Security Assessment 13. Port Facility Security Plan 14. Port Facility Security Officer 15. Training, Drills, and Exercises on Port Facility Security 16. Verification & Certification for Ships 	<ol style="list-style-type: none"> 1. Context of the organization – Strategic Considerations 2. Management leadership & worker participation 3. Planning 4. Support (resources, education, training, & competence, awareness & communication, and document control) 5. Implementation & operation (operation planning & control, identification of OHSMS, risk assessment, hierarchy of controls, design review & management of change, procurement, contractors, occupational health, emergency preparedness) 6. Evaluation & corrective action (Monitoring, measurement, & assessment, incident investigation, audits, corrective actions, feedback & organizational learning) 7. Management review

Appendix 2 Scope & Content of Related Integrated Management System (IMS)

PAS 99	ISRS 9	OEMS	SUPREME
1. Context of organization	1. Leadership	1. Leadership commitment	1. Leadership & Accountability
2. Leadership (leadership & commitment, policy, and role, responsibilities & authorities)	2. Planning & administration	2. Safe operation	2. Policy & Objectives
3. Planning	3. Risk evaluation	3. Reliability & integrity management	3. Organization, Responsibility, Resource, & Document
4. Support (resources, competence, awareness, communication, and documented information)	4. Human resources	4. Hazard & risk management	4. Risk Management
5. Operation (planning & control, design, and procurement)	5. Compliance	5. Management of change	5. Planning & Procedure
6. Performance evaluation (monitoring, measurement, analysis & evaluation, internal audit, management review)	6. Projects	6. Environment management & regulatory compliance	6. Implementation & Operational Control
7. Improvement (nonconformity & corrective action, and continual improvement)	7. Competence	7. Incident management	7. Assurance: Monitoring, Measurement, & Audit
	8. Communication & promotion	8. Training & competency assurance	8. Review
	9. Risk control	9. Document & information management	9. Site Physical Tour
	10. Asset integrity	10. Project	10. Site Barrier Tour
	11. Contractors & suppliers	11. Emergency management	
	12. Emergency preparedness	12. Contractor & supplier management	
	13. Learning from events	13. Performance review	
	14. Risk monitoring		
	15. Result & review		
	16. Physical Condition Tour		
	17. Process Barrier Assessment		