http://dx.doi.org/10.18623/rvd.v23.6037

OPERATIONAL KAIZEN: INNOVATION AND CONTINUOUS IMPROVEMENT IN PORT LOGISTICS, SUSTAINABILITY AND SECURITY

KAIZEN OPERACIONAL: INOVAÇÃO E MELHORIA CONTÍNUA EM LOGÍSTICA PORTUÁRIA, SUSTENTABILIDADE E SEGURANÇA

Article received on: 12/14/2025
Article accepted on: 3/14/2026

Gloria Viridiana Vallejo Navarrete*
*Instituto Tecnológico de Lázaro Cárdenas, Lázaro Cárdenas, México
Orcid: https://orcid.org/0000-0002-4270-794X
gloriavirivn@lcardenas.tecnm.mx

Ofelia Barrios Vargas*
*Instituto Tecnológico de Lázaro Cárdenas, Lázaro Cárdenas, México
Orcid: https://orcid.org/0000-0003-4139-503X
ofelia.bvargas@lcardenas.tecnm.mx

María del Socorro Sánchez Valencia*
*Instituto Tecnológico de Lázaro Cárdenas, Lázaro Cárdenas, México
Orcid: https://orcid.org/0009-0002-3129-8279
masocorro.sanchez@lcardenas.tecnm.mx

Yesica Castañeda García*
*Instituto Tecnológico de Lázaro Cárdenas, Lázaro Cárdenas, México
Orcid: https://orcid.org/0009-0005-2092-5304
yesica.castaneda@lcardenas.tecnm.mx

Karen Aimé Galeana Valdovinos*
*Instituto Tecnológico de Lázaro Cárdenas, Lázaro Cárdenas, México
Orcid: https://orcid.org/0009-0003-9033-5022
itlac21560358@lcardenas.tecnm.mx

The authors declare that there is no conflict of interest

Abstract
The objective of the article is to integrate the Kaizen philosophy, complemented by Toyota Business Practices (TBP), which are a comprehensive strategy for addressing incidents that occur in a logistics company in the port of Lázaro Cárdenas. In the former, 47% of incidents involved operational personnel, with thirty-eight incidents resulting in property damage and incapacitation of up to 90 days. Workplace safety and port logistics management face critical challenges arising from recurring personnel incidents, high costs associated with work incapacities and material damage, deficiencies in incident documentation, coupled with high staff turnover and delays in the completion of activities which, although they may seem minor, generate delays, wasted time, and inefficiencies in health and safety processes. The lack of Lean tools makes it difficult to prepare monthly reports, causes a great deal of wasted time and errors due to duplication, makes it impossible to

Resumo
O objetivo do artigo é integrar a filosofia Kaizen, complementada pelas Práticas Empresariais da Toyota (TBP), que constituem uma estratégia abrangente para lidar com os incidentes que ocorrem em uma empresa de logística no porto de Lázaro Cárdenas. Nessa empresa, 47% dos incidentes envolveram pessoal operacional, sendo que trinta e oito deles resultaram em danos materiais e incapacidade de até 90 dias. A segurança no trabalho e a gestão da logística portuária enfrentam desafios críticos decorrentes de incidentes recorrentes com o pessoal, altos custos associados a incapacidades para o trabalho e danos materiais, deficiências na documentação de incidentes, aliadas à alta rotatividade de pessoal e atrasos na conclusão de atividades que, embora possam parecer menores, geram atrasos, perda de tempo e ineficiências nos processos de saúde e segurança. A falta de ferramentas Lean dificulta

distinguish between incidents involving injury and those involving material damage, limits the possibility of analyzing trends or recurrences, and makes reviews and audits difficult. Therefore, the above has a significant impact on the productivity and competitiveness of organizations in a global context.The objective of the study is to apply Kaizen and TBP methodologies to safety and logistics management processes, establishing SMART objectives, which consist of reducing the time needed to generate incident reports by at least 40% and ensuring 100% traceability of recorded information. This will achieve a 10% reduction in the recurrence of similar incidents and ensure that 100% of investigated events have their root causes documented in the official format. Achieve an 80% improvement in the accuracy of the "IMSS Disabilities" dashboard. The goal is to standardize manual recording processes, which are slow and prone to errors, delaying report generation and trend analysis.The expected success of integrating the TBP (Toyota Business Practices) methodology is to transform reactive management into a digitized, preventive system with a high operational impact. The goal is to improve KPIs such as consolidation time, information search time, reduction and accuracy, errors, and data duplication, thereby achieving information traceability and absolute control and identifying findings of repetitive operational incidents due to a lack of root cause analysis.

Keywords: Organizational Culture. Workplace Incident Management. Operational Kaizen. Port Logistics Security. Toyota Business Practices (TBP). Transportation and Logistics.

a elaboração de relatórios mensais, causa grande perda de tempo e erros devido à duplicação de tarefas, impossibilita a distinção entre incidentes envolvendo lesões e aqueles envolvendo danos materiais, limita a possibilidade de analisar tendências ou recorrências e dificulta revisões e auditorias. Portanto, o exposto acima tem um impacto significativo na produtividade e competitividade das organizações em um contexto global. O objetivo do estudo é aplicar as metodologias Kaizen e TBP aos processos de gestão de segurança e logística, estabelecendo objetivos SMART, que consistem em reduzir o tempo necessário para gerar relatórios de incidentes em pelo menos 40% e garantir 100% de rastreabilidade das informações registradas. Isso alcançará uma redução de 10% na recorrência de incidentes semelhantes e garantirá que 100% dos eventos investigados tenham suas causas-raíz documentadas no formato oficial. Alcançar uma melhoria de 80% na precisão do painel "IMSS Disabilities". A meta é padronizar os processos de registro manual, que são lentos e propensos a erros, atrasando a geração de relatórios e a análise de tendências. O sucesso esperado da integração da metodologia TBP (Toyota Business Practices) é transformar a gestão reativa em um sistema digitalizado e preventivo com alto impacto operacional. O objetivo é melhorar KPIs como tempo de consolidação, tempo de busca de informações, redução e precisão, erros e duplicação de dados, alcançando assim a rastreabilidade das informações e o controle absoluto, além de identificar conclusões de incidentes operacionais repetitivos devido à falta de análise da causa raiz.

Palavras-chave: *Cultura Organizacional. Gestão de Incidentes no Local de Trabalho. Kaizen Operacional. Segurança Logística Portuária. Práticas de Negócios da Toyota (TBP). Transporte e Logística.*

1 INTRODUCTION

The Kaizen methodology is a tool that complements TBP's practices as a comprehensive strategy. This study aims to describe the optimization of safety processes, the efficiency of vehicle management, regulatory compliance, and the minimization of

incidents (which in the first shift amount to 47%, with 76% of incidents involving operational personnel). It also seeks to reduce waste and unproductive time, all of which are key factors in ensuring the competitiveness and productivity of the port logistics company.

Several studies have demonstrated that occupational health and safety management requires structured methodologies that allow for the identification of root causes and the prevention of recurring incidents. Moran-Fuentes et al. (2022) point out that the systematic application of workplace safety practices improves incident traceability and strengthens organizational culture. Similarly, the National Institute of Industrial Technology (INTI, 2022) emphasizes that the Kaizen philosophy applied in the workplace contributes to reducing risks and consolidating safer and more sustainable environments. Furthermore, Vasquez Poma (2024) shows that the correct application of health and safety systems in production and service companies increases operational efficiency and significantly reduces the costs associated with work-related disabilities.

These findings confirm that integrating methodologies such as Kaizen and Toyota Business Practices (TBP) into workplace incident management can generate tangible benefits in organizational productivity and sustainability. As a result of applying these methodologies, A3 and Ishikawa diagrams were implemented for each incident, ensuring that not only was the event described, but the triggering factor was also identified. Automating calculations and providing immediate visualization on the dashboard significantly reduced the hours spent on administrative tasks. Operational staff improved their accuracy in using digital tools by 80%, reducing recording errors to less than 5%.

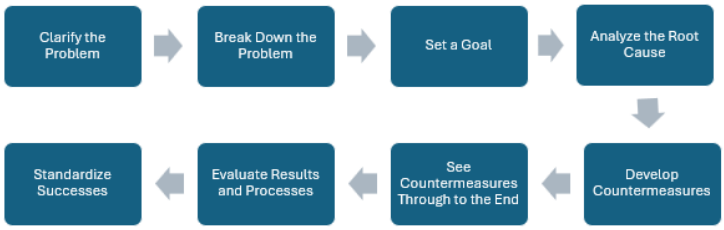
2 METHODOLOGY

This study employs a mixed-methods approach—qualitative, quantitative, and descriptive—in a logistics company at the port of Lázaro Cárdenas. The population considered is operational personnel. The sample consists of operational workers.

The implementation of the Toyota Business Practices (TBP) methodology consists of 8 stages, as described in Figure 1.

Figure 1

Block diagram of the methodology.



1. In the problem clarification stage, an analysis of the inputs and outputs of the processes was sought to identify the current situation using the SIPOC tool, which stands for Supplier – Inputs- Process- Outputs – Customers, and Gemba walks.
2. The second stage involves breaking down the problem: The areas where incidents occur were identified, risk areas were identified, and the Pareto diagram was used.
3. The third stage is to set a goal; SMART objectives were defined according to the problems identified.
4. Within the fourth step of the methodology, analyzing the Root Cause, the failure that generates the problem was sought through the use of the 5 Whys tool.
5. The fifth step involves developing countermeasures: operational innovations were designed using Kaizen tools
6. The sixth step involves reviewing the countermeasures to the end: information was collected from the data observed during the implementation phase.
7. The seventh step is to evaluate results and processes: statistical comparative analyses were performed before and after the changes.
8. The final step involves standardizing the successes: the documentation of the new Standard Operating Procedure (SOP) was carried out.

3 RESULTS

3.1 Clarify the problem

The occupational health and safety (QHSE) management system was identified as operating under a manual and fragmented scheme. Table 1 describes the diagnostic

information for the current incident management process, revealing that manual inputs and records generate incomplete and unreliable outputs. The SIPOC (System for the Investigation of Incidents) demonstrates a fragmented and unconsolidated process, confirming the need to centralize and digitize incident management. Furthermore, Table 2 shows the SIPOC for the current recurring incident investigation process, constructed with information obtained from this process. It reveals that inputs, the process itself, and outputs are disjointed: reports are recorded without in-depth analysis, communication is incomplete, and consolidation lacks diagnostic tools. This results in partial data and reports lacking root cause analysis, directly impacting QHSE, audits, and management. Therefore, it is confirmed that the current process does not guarantee useful and reliable information to prevent the recurrence of incidents.

Table 1

SIPOC Incident Management Map.

Supplier	Tickets	Process	Departures	Customer
Supervisors	Incident reports and manual forms	Recording and analysis of events on physical sheets or scattered files	Manual reports without consolidation	QHSE Area
Safety and Hygiene	IMSS disability information	Classification and filing of reports	Partial data for monthly analysis	Management / Audit
Operational staff	Data on events that occurred	Verbal or written communication	Incomplete or late registration	External consultant

Source: Prepared by the author based on a diagnosis of the Safety and Hygiene area, logistics company (2025).

Table 2

SIPOC map of the current process for investigating recurring incidents.

S – Suppliers	I – Inputs	P – Process	O – Outputs	C – Customers
Area Supervisors	Operational incident reports	Manual recording of the event without in-depth analysis	Reports without root cause identification	QHSE Area
Operational staff	Event information and witnesses	Verbal communication without analysis format	Incomplete and repetitive data	External consultant / Audits
Safety and Hygiene	Lists of historical incidents	Consolidation without diagnostic tools	Records with partial information	Management / SSA Marine Mexico

Source**:** Prepared by the author based on observations from the Safety and Hygiene area, logistics company (2025).

Subsequently, a SIPOC analysis of the incident investigation from completion process was conducted in the area. Table 3 summarizes the impacts associated with the use of outdated forms and incomplete records. These findings show that the lack of differentiation between incident types, insufficient follow-up, and the absence of statistical data generate confusion, delays, and unverified actions. It was observed that the current documentation process does not meet control requirements or comply with TBP-Kaizen principles. The diagnostic SIPOC analysis reveals that data entry errors, lack of validation, and limited use of digital resources generate incorrect information, delays, and dependence on the QHSE area.

Table 3

Impact of the problem.

Observed impact	Consequence
Incomplete or non-existent fields	Insufficient information for audits.
The types of incidents are not differentiated	Confusion between events with injury and with material damage.
Lack of documented follow-up	Corrective actions without verification.
Difficulty in generating statistical reports	Prolonged times for analysis or closures.
Outdated formats	Lack of alignment with the TBP-Kaizen methodology.

Source**:** Prepared by the author based on a diagnosis of the Safety and Hygiene area, logistics company (2025).

Likewise, it was determined that the process is critical in the availability of real-time data, with an average delay of 10 hours to consolidate monthly reports of incidents and disabilities.

3.2 Break down the problem

Through information flow analysis, inefficiencies were segmented: 90% of the Security personnel's time was consumed in administrative office tasks, filling out Excel spreadsheets, searching for physical files instead of being at Gemba preventing risks.

3.3 Set a goal

To establish the objective, quantitative goals aligned with operational efficiency were defined to: reduce incident report generation time by at least 40%, guarantee 100% traceability of recorded information, and decrease the recurrence of similar incidents by 10%. When implementing a root cause analysis system with Kaizen tools, the aim is to ensure that 100% of investigated events have a documented root cause in the official format, thereby reducing data entry errors by 50%. This will be achieved by documenting 100% of records, ensuring they are complete and classified by incident type. Subsequently, in the second half of 2025, a technical and practical training program for incident capture will be implemented to improve the accuracy of the "IMSS Disabilities" Dashboard by 80% and increase the reliability of automated indicators to 95% before the end of the year.

3.4 Analyze the root cause

The Ishikawa diagram and the 5 Whys method were used to get to the root of the problem. Table 4 describes the *5 Whys analysis*. It was subsequently determined that the cause was not a lack of data, but rather the absence of a centralized and standardized platform. The records were redundant, manual, and prone to data entry errors (18%).

Table 4

5 Whys Analysis

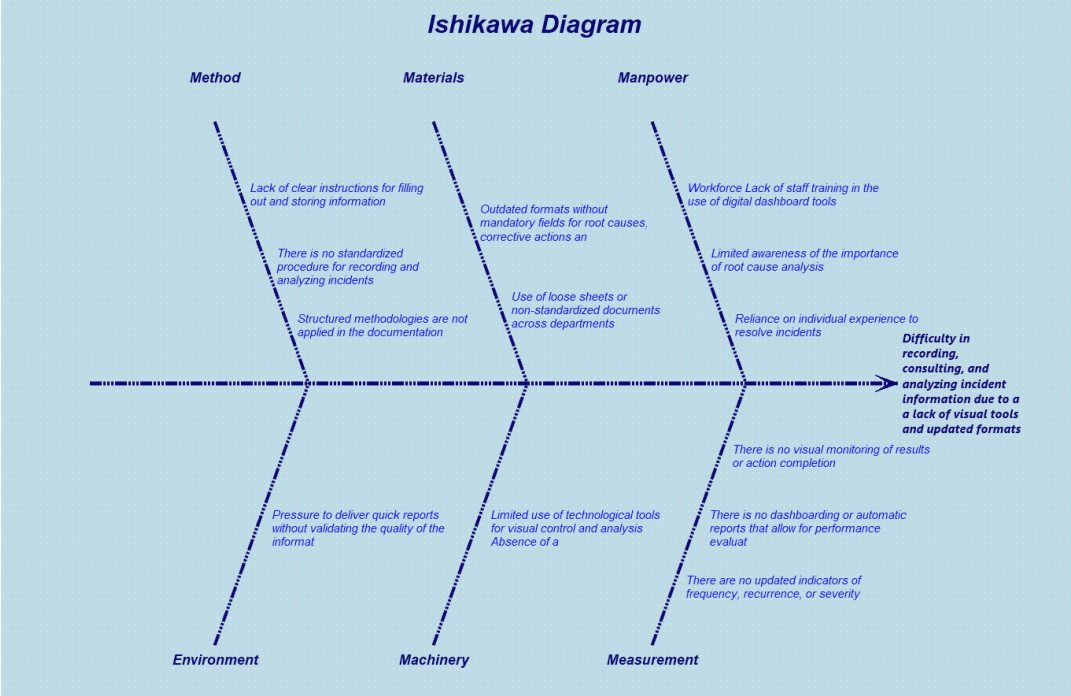
Ask	Identified response
1. Why are there no updated visual tools?	Because the records are kept manually on scattered sheets.
2. Why are the records manual?	Because there is no standardized digital format available.
3. Why hasn't a digital format been created?	Because there was no formal procedure that required it.
4. Why is there no formal procedure?	Because the need for visual integration and its impact had not been identified.
5. Why had the need not been identified?	Because the area did not have indicators that showed documentary inefficiency.

Source**:** Prepared by the author based on records from the Safety and Hygiene area, logistics company (2025).

Figure 2 describes the Ishikawa diagram; this analysis confirms that the problem is multifactorial and requires standardization and digitization of the process.

Figure 2

Ishikawa diagram.

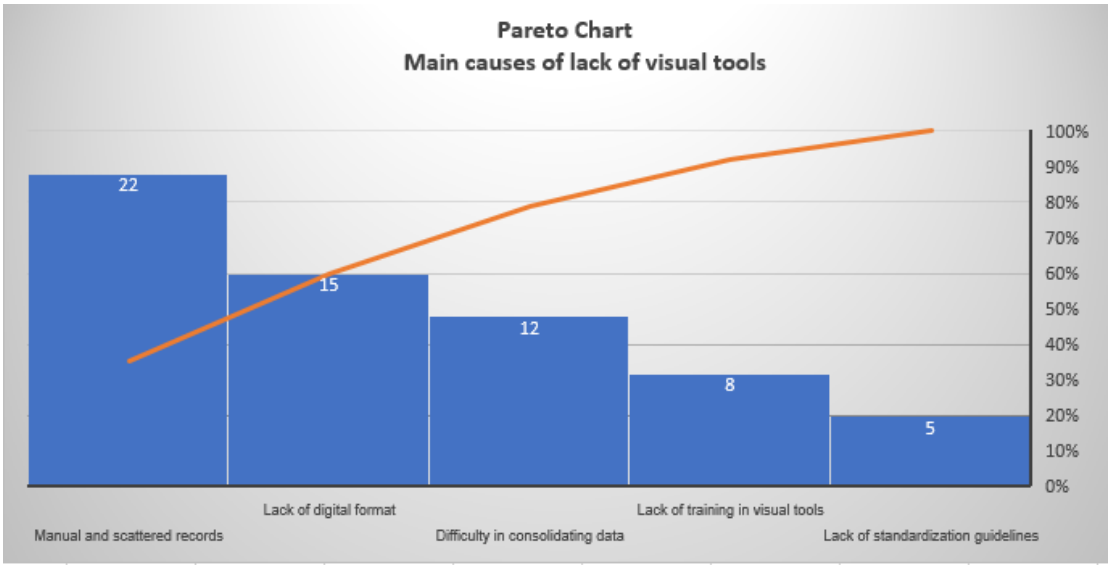


Source**:** Prepared by the author based on analysis by the Safety and Hygiene area, logistics company (2025).

Furthermore, a Pareto chart was created based on the frequency of causes identified in the previous records. It shows that the most frequent causes of the problem are manual and scattered records (22 cases, 36%) and the lack of a digital format (15 cases, 60% cumulative). Along with the difficulty in consolidating data (12 cases, 80%), these causes account for most of the problems, as shown in Figure 3.

Figure 3

Pareto charts the main causes of the lack of visual tools.



Source**:** Prepared by the author based on records from the Safety and Hygiene area, logistics company (2025).

3.5 Develop Countermeasures

A solution based on digitization and visual management was designed. An automated, real-time digital dashboard was created, and incident investigation formats were standardized according to international criteria (ISO 45001). Three main visual elements were integrated as part of the solution. Table 5 shows the database organization used to create the dashboard, which is shown in Figures 4 and 5.

Table 5

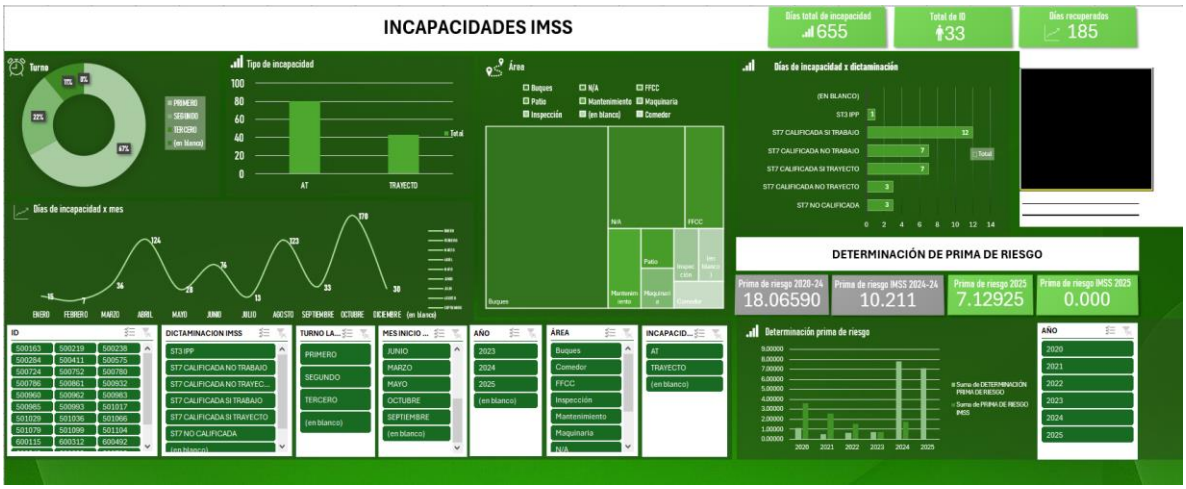
Normalization is used as the dashboard database.

AÑO	MES	FECHA DE INCIDEN	ÁREA	Puesto	PO DE CONT	TURNO LABOR	DESCRIPCION DEL RIESGO	CLASIFICACION DEL RIESGO	AREA DEL ACCIDE	LUGAR DE ACCIDENTE
2025	OCTUBRE	25/10/2025 12:00	Buques	Trincador de autos	PLANTA	PRIMERO	le trinca mientras camina entre ui	Contusión	Buque	Buque Goliath Leader
2025	OCTUBRE	10/9/2025 20:00	Buques	Operador auto	PLANTA	SEGUNDO	Se traslada de pasajero en una camioneta UT la camioneta	lumbago no especificado al ir de pasajero en UT	Buque	buque SUNLIGHT ACE
2025	OCTUBRE	10/1/2025 9:00	FFCC	Operador auto	PLANTA	PRIMERO	Operador quien tenere levantar	Sobre esfuerzo	FFCC	FFCC VÍA 6
2025	OCTUBRE	10/4/2025 19:00	Buques	Supervisor	CONFIANZA	SEGUNDO	En buque MORNING CAMILLA, se	Contusión	Buque	Buque MORNING CAMILLA
2025	SEPTIEMBRE	9/30/2025 15:30	Buques	Operador auto	EVENTUAL	PRIMERO	Mientre el dia se de bajar de una	Contusión	N/A	
2025	SEPTIEMBRE	9/12/2025 16:30	N/A	N/A	EVENTUAL	SEGUNDO	Incidente en trayecto de trabajo	TORSION/EVERSION AL CAMINAR	N/A	Trayecto trabajo a casa
2025	SEPTIEMNRE	9/6/2025 12:00	Buques	Trincador de autos	EVENTUAL	SEGUNDO				
2025	AGOSTO	8/26/2025 0:00	Patio	Asistente	CONFIANZA	SEGUNDO	Lo atropella moto al bajar de	Atropellamiento	N/A	Trayecto casa a domicilio
2025	AGOSTO	8/25/2025 10:00	Buques	Operador auto	EVENTUAL	PRIMERO	Deja su dedo entre marco de la	Atrapamiento	Buque	Area de Nodriza
2025	AGOSTO	7/31/2025 5:30	Buques	Trincador maquinaria	EVENTUAL	SEGUNDO	usión de segundo dedo mano izqui	Contusión	Maquinaria	A bordo del buque
2025	AGOSTO	8/1/2025 23:00	N/A	N/A	EVENTUAL	TERCERO	Lo impactan en su motocicleta	Contusión	N/A	Ciudad LZC
2025	JULIO	7/20/2025 17:00	N/A	N/A	EVENTUAL	PRIMERO	Cae de su motocicleta.	Caida a mismo nivel	N/A	Terraceria
2025	JULIO	7/3/2025 22:00	Buques	Operador auto	PLANTA	SEGUNDO	Se baja de ut en punto de	TORSION/EVERSION AL CAMINAR	Buque	Plataforma 3, punto de hidratación
2025	JUNIO	6/26/2025 16:30	N/A	N/A	EVENTUAL	PRIMERO	Derrapa su motocicleta.	Atropellamiento	N/A	Trayecto trabajo-casa
2025	JUNIO	6/18/2025 6:30	Mantenimiento	Asistente	EVENTUAL	PRIMERO	Derrapa motocicleta	Caida diferente nivel	N/A	Trayecto a trabajo
2025	JUNIO	6/12/2025 0:00	N/A	N/A	PLANTA	PRIMERO	Sufre caida de su propia altura al	Caida a mismo nivel	N/A	TRAYECTO A TRABAJO
2025	JUNIO	6/4/2025 0:00	Mantenimiento	Tecnico	CONFIANZA	PRIMERO	Sufre picadura de abejas al estar	Exposicion a fauna nociva	ASIPONA	Patio de IPG
2025	MAYO	5/29/2025 0:00	Buques	Trincador auto	EVENTUAL	SEGUNDO	Refiere dice IMSS, mientras la	Movimientos repetitivos	Buque	A bordo del buque
2025	MAYO	5/13/2025 0:00	Buques	Operador auto	EVENTUAL	SEGUNDO	ria y antes de bajar totalmente ca	Sobre esfuerzo	Buque	En el patio
2025	ABRIL	4/3/2025 0:00	Buques	Operador auto	EVENTUAL	SEGUNDO	Pierde mano entre cabina y vaja	Atrapamiento	Buque	A bordo de buque
2025	ABRIL	4/12/2025 0:00	Buques	Operador auto	EVENTUAL	TERCERO	va de pasajero en una ut en	Contusión	Buque	A bordo del buque
2025	ABRIL	4/4/2025 0:00	Buques	Alineador	PLANTA	PRIMERO	Al estar caminando se dobla	Movimientos repetitivos	Buque	Patio
2025	ABRIL	4/2/2025 0:00	Buques	Amarrador	PLANTA	TERCERO	Operador al estar pateo cabos	Sobre esfuerzo	Buque	Plataforma 3
2025	MARZO	3/22/2025 0:00	Buques	Operador auto	EVENTUAL	PRIMERO	Contractura muscular torax,	Sobre esfuerzo	Buque	
2025	MARZO	3/23/2025 0:00	Buques	Operador auto	EVENTUAL	TERCERO	Contusion del torax	Contusión	Buque	Bloque O
2025	MARZO	3/10/2025 0:00			EVENTUAL	TERCERO	Contusion en pierna derecha	Caida a mismo nivel	N/A	Trayecto de domicilio al trabajo
2025	MARZO	3/10/2025 0:00	Buques	Operador auto	PLANTA	TERCERO	Contusion por impacto por	Contusión	Buque	Bloque I
2025	MARZO	3/6/2025 0:00	Buques	Operador auto	EVENTUAL	TERCERO	Contusion en torax	Contusión	Buque	A bordo de buque, deck 12.
2025	FEBRERO	2/12/2025 0:00	Comedor	Asistente	CONFIANZA	PRIMERO	Policontundido	Contusión	N/A	Ciudad
2025	FEBRERO	2/10/2025 0:00	Inspección	Asistente	CONFIANZA	PRIMERO	Lumbalgia mecanica,	Manejo manual de cargas	N/A	Lavando igloo en Motor Pool.
2025	ENERO	1/29/2025 0:00	N/A	N/A	EVENTUAL	SEGUNDO	Operador sufre accidente	Contusión	N/A	Naranjito Guerrero
2025	ENERO	1/21/2025 0:00	FFCC	Operador auto	PLANTA	PRIMERO	Se dobla tobillo al bajar escalera	Caida a mismo nivel	FFCC	Bajando el FFCC
2025	ENERO	1/9/2025 0:00	Maquinaria	Trincador maquinaria	PLANTA	PRIMERO	Sufre golpe contuso en pie	Caida de objetos	Maquinaria	A bordo de buque
2024	DICIEMBRE	12/9/2024 0:00	FFCC	Operador auto	PLANTA	PRIMERO	Contusión en rodilla en puerta	Contusión	FFCC	A bordo del FFCC

Source**:** Prepared by the author based on records from the Safety and Hygiene area, logistics company (2025).

Figure 4

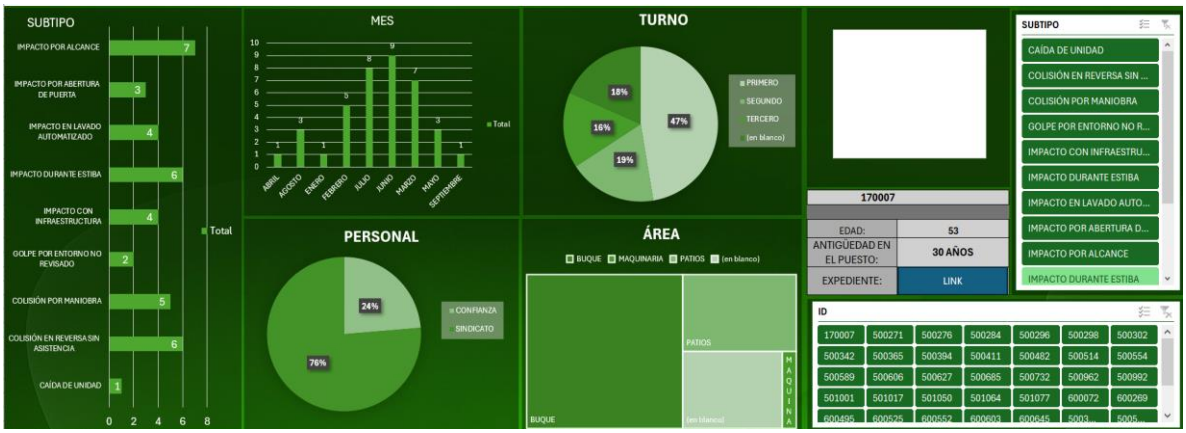
Final dashboard of visual control "Disabilities in the IMSS"



Source: Prepared by the author based on internal development of the Safety and Hygiene area, logistics company (2025).

Figure 5

Dashboard with material damage



Source: Prepared by the author based on internal development of the Safety and Hygiene area, logistics company (2025).

3.6 See countermeasures to the end

Once the pilot system was implemented in the Health and Safety Department, data duplication was eliminated. In fact, staff were trained to migrate from paper reports to validated digital entries, achieving 100% record completeness.

3.7 Evaluate results and processes

The evaluation of the processes was carried out statistically, confirming the success of the Kaizen intervention, as shown in Table 6.

Table 6

Comparative results.

Indicator	Before the upgrade	After the upgrade	Variation (%)
Average time to consolidate monthly reports	10 hours	1.5 hours	85%
Average time to complete form	15 min	7 min	53%
Percentage of complete and traceable records	62%	100%	38%
Errors or duplication in records	18%	0%	100%

Data traceability by event	Partial	Total (100%)	100%

Source: Prepared by the author based on dashboard validation results, logistics company (2025).

3.8 Standardize successes

To ensure that the improvement is permanent (Sustainability), the new process was formalized, the Standard Operating Procedures (SOPs) for the QHSE area were updated, and the use of the Dashboard was integrated as the official tool for internal audits. The *Yokoten was carried out* (Sharing knowledge) with the logistics areas to replicate this visual management model. In Table 7, the indicators, after implementation, showed a significant improvement in the quality of the analyses and a reduction in repetitive events.

Table 7

Results obtained.

Indicator	Before the upgrade	After the upgrade	Variation (%)
Reports with root cause analysis	42%	100%	58%
Recurrence rate of similar incidents	29%	10%	66%
Reports with verified corrective action	21%	95%	74%
Average report closing time	12 days	5 days	58%
Staff level of understanding of cause analysis	55%	95%	40%

Source: Prepared by the author based on validation of the A3 format and dashboard (2025).

4 DISCUSSION

The study demonstrates the successful execution of the improvement and control phase, which is central to Lean Manufacturing and Continuous Improvement: “creating value through the absolute elimination of waste (MUDA).” This was due to the existence of over-processing and untapped talent, and the most critical finding was that over 80% of security personnel time was consumed by manual administrative tasks. Furthermore, it was correctly identified that the recurrence of incidents was not due to a lack of data, but rather a lack of in-depth analysis. To raise the level of operational maturity, it is necessary to investigate how resistance to change affects the accuracy of data capture

among personnel of different ages and seniority levels, and to integrate real-time control charts into the dashboard to automatically alert when an incident type deviates from normal historical limits, allowing for immediate intervention before a crisis occurs.

5 CONCLUSIONS

Upon completion of the integration of the Toyota Business Practices (TBP) methodology, successfully transforming reactive management into a digitized, proactive, and high-impact operational system, the following results were achieved: information digitization; the organizational culture was transformed by freeing up 85% of administrative time; the security team can now focus on proactive security, directly impacting the port's sustainability by reducing operational risks and improving the well-being of human capital. Furthermore, It achieved a significant 85% improvement in the time required to consolidate monthly reports, reducing it from 10 hours to just 1.5 hours, and a 91% reduction in information search time. Furthermore, 100% traceability and completeness of records were achieved, eliminating data duplication and manual errors, which previously accounted for 18% . In conclusion, one of the most significant findings was the reduction in the recurrence rate of similar incidents, from 29% to 10%. This is how 100% of reports now include a root cause analysis.

Authors' Contribution

Dr. Ofelia Barrios Vargas participated in the conceptualization of the study, methodological design, statistical analysis, and writing of the manuscript.

REFERENCES

Do, T. L. C. (2024). Improving economic efficiency and workplace safety in production facilities using the 5S–Kaizen method. *Environmental Sustainability*. https://doi.org/10.22158/se.v9n1p44

National Institute of Industrial Technology. (2022). *Kaizen in the workplace: Focus on occupational safety*. INTI.

Moran-Fuentes, J. J., Carlos-Ornelas, C. E., & Soto-Morones, H. (2022). Occupational health and safety management practices: A systematic literature review.

Administrative Sciences: Theory and Praxis, *18*(1). https://doi.org/10.46443/catyp.v18i1.304

Naseri, R. N. N., & Esa, M. M. (2025). Kaizen and workplace safety: The role of continuous improvement in Japanese safety management systems. *International Journal of Research and Innovation in Social Science*, *9*(4), 70–75. https://doi.org/10.47772/ijriss.2025.90400005

Sihombing, R., Suhaeri, Sarjono, & Purba, H. H. (2025). Implementing Kaizen in diverse industries: A systematic literature review. *Performa*, *24*(2), 224–235. https://doi.org/10.20961/performa.v24i2.2746

Syaputra, M. J., & Aisyah, S. (2022). Kaizen method implementation in industries: Literature review and research issues. *IJIEM (Indonesian Journal of Industrial Engineering and Management)*, *3*(2), 116. https://doi.org/10.22441/ijiem.v3i2.15408

Vasquez Poma, R. J. (2024). Application of occupational safety and health in production and service companies: Literature review. *Journal of Scientific and Technological Research Industrial*, *5*(2).

Authors' Contribution

All authors contributed equally to the development of this article.

Data availability

All datasets relevant to this study's findings are fully available within the article.

How to cite this article (APA)

Navarrete, G. V. V., Vargas, O. B., Valencia, M. del S. S., García, Y. C., & Valdovinos, K. A. G. (2026). OPERATIONAL KAIZEN: INNOVATION AND CONTINUOUS IMPROVEMENT IN PORT LOGISTICS, SUSTAINABILITY AND SECURITY. *Veredas Do Direito*, *23*(6), e236037. https://doi.org/10.18623/rvd.v23.6037