

Occupational Safety Compliance among Civil Engineers in the Department of Public Works and Highways, Isabela Second District Engineering Office

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Abstract

The construction industry is vital to economic growth, employing over 350 million people and contributing significantly to global GDP. However, it poses dangers such as falls and long-term health issues. Effective risk management is crucial for project success, as safety at work is a global priority, with around 6,000 work-related deaths daily. The Occupational Safety and Health Administration (OSHA) enforces safety rules to promote a safe workplace and individual responsibility, helping prevent accidents while boosting productivity and morale.

A study on safety compliance among civil engineers at DPWH Isabela 2nd DEO aimed to enhance road construction project management. It used a descriptive-comparative design, with 49 of 55 engineers selected via stratified random sampling. Data collection involved a questionnaire based on existing literature and DPWH practices, analyzed using Weighted Mean, ANOVA, and t-tests. Most participants were male, aged 25-34, college graduates, with 5-10 years of experience. Findings revealed high compliance in safety signage, hazard identification, behavioral safety, emergency preparedness, and health monitoring, while lower compliance was noted in accident prevention, safety training, personal protective equipment, legal compliance, and site safety management.

To improve safety compliance, the study recommends integrating safety into all programs, promoting a strong safety culture, encouraging employee participation in safety meetings, and developing OSH strategies for all workers.

Keywords: Occupational Safety; Hazard; Safety Compliance; Hazard Identification and Risk Assessment

1. Introduction

The construction industry is crucial for a country's development (Nguyen & Macchion, 2023). It is relevant to national economic and social development. It plays a critical role in building nations and societies (Yuan et al., 2024). More than 350 million people are engaged in building construction worldwide (Bo'an et al., 2024). It represents 6% of the world's gross domestic product (GDP) and is expected to reach more than 14% by 2030 (Muñoz-La Rivera et al., 2021).

However, it is globally known as one of the most hazardous workplaces (Calunsag, 2024; Sarvari et al., 2024; Alharbi et al., 2024; Giri et al., 2023; Koh et al., 2021). With its complex working conditions and challenging procedures (Prasetyo & Arvitrida, 2025), as well as a high level of uncertainty, the construction industry is the third most hazardous, after mining and agriculture (Bo'an et al., 2024; Mencias et al., 2022). The construction site is prone to hazards due to the presence of large machinery, heavy objects, and moving vehicles (Azi et al., 2021). Construction workers face various hazards, including falls, electrical accidents, machinery-related injuries, and long-term health issues such as respiratory problems (Tanganan et al., 2024).

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Occupational safety is a global priority, as work-related accidents impose significant economic and social burdens. According to the International Labor Organization (ILO, 2024), approximately 6,000 workers die each day due to work-related accidents and diseases (Graham et al., 2024).

The Occupational Safety and Health Administration (OSHA) plays a vital role in establishing and enforcing occupational health and safety regulations, providing guidelines for employers and management to ensure a safe workplace (Hussain et al., 2024). The safety program raises awareness among all organizational members about the company's commitment to safety and health, emphasizing individual responsibilities (Zhong, 2024). Ensuring safety compliance is crucial for reducing the risk of injury in organizations (Graham et al., 2024).

Prioritizing safety compliance is vital to effectively reduce organizational risks and prevent injuries (Graham et al., 2024). Occupational accidents in organizations cause significant harm to employees each year, resulting in lost productivity, compensation costs, and absenteeism. Additionally, employee absences can negatively impact workforce morale. Recent investigations into major industrial accidents have highlighted inadequate safety management as a key factor. Consequently, there has been a shift from merely addressing human and technical errors to prioritizing employee safety through effective management. Safety management is necessary for preventing occupational accidents (Ajmal et al., 2022).

Research Questions

- What is the demographic profile of the respondents?
- What is the level of safety compliance of the civil engineers of the DPWH Isabela 2nd DEO?
- Is there a significant difference in the level of safety compliance of civil engineers when grouped according to their demographic profile?
- What measures can be proposed to improve the occupational safety compliance in DPWH Isabela 2nd DEO?
- What recommendations can be proposed to improve the occupational safety compliance in DPWH Isabela 2nd DEO?

1.1. Research Hypothesis

There is no significant difference in the level of safety compliance of civil engineers grouped according to their demographic profile.

2. Conceptual Framework

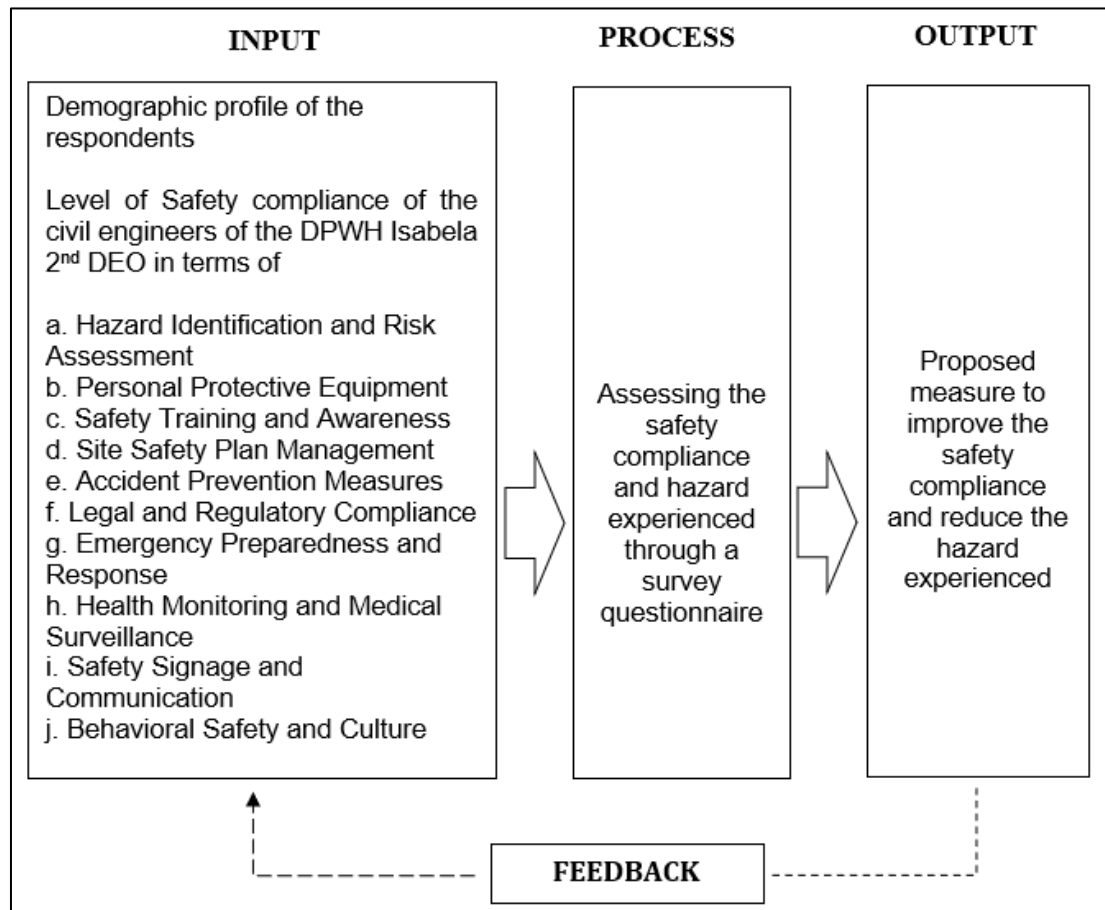


Figure 1 Conceptual Paradigm of the Study

The study used the input, process, and output variables as the model. The input variables are the civil engineers' safety compliance and their experience with hazards. The process is assessing safety compliance and hazards experienced through a survey questionnaire. The output variable is the proposed measures to improve the safety compliance and reduce the hazard experienced.

3. Literature Review

Construction safety compliance is essential in preventing workplace accidents, injuries, fatalities, property damage, and project delays. It involves adherence to occupational safety and health (OSH) regulations, the proper use of personal protective equipment (PPE), implementation of safety manuals, and continuous safety training to protect workers while improving organizational productivity (Giri et al., 2023; Gaur et al., 2025; Afework et al., 2024). Research emphasizes that effective safety programs depend on strong management commitment, strict policy enforcement, safety awareness, supervision, and the availability of comfortable PPE, all of which contribute to higher compliance and improved project outcomes (Febrianti & Widajati, 2025; Alzamzami et al., 2025).

Studies also indicate that demographic factors influence occupational safety. Younger, male, single, and less experienced workers are more susceptible to workplace accidents, while education, work experience, and positive attitudes toward safety improve compliance with safety practices (Bilim, 2025; Dzah, 2023). Furthermore, safety representatives, emergency preparedness, hazard communication, and well-designed safety signage enhance workers' awareness, preparedness, and adherence to safety protocols, resulting in fewer accidents and improved organizational performance (Friebel et al., 2024; Purba et al., 2025; Syakira et al., 2025; Isreal, 2025).

Hazard identification and risk assessment are fundamental components of occupational health and safety management. Construction sites expose workers to numerous hazards, including falls, electrocution, machinery accidents, airborne

contaminants, excessive noise, and other physical risks (Ikpesu et al., 2024; Darwis et al., 2021). Systematic hazard identification and continuous risk assessment enable organizations to recognize potential hazards, evaluate their likelihood and severity, and implement appropriate control measures to minimize risks and prevent accidents (Safeopedia, 2024; Lee & Lee, 2023; Darwis et al., 2021).

In the Philippines, occupational health and safety are supported by a comprehensive legal framework, including the Philippine Constitution, the Labor Code, Commonwealth Act No. 104, Republic Act No. 1054, and various regulations implemented by the Department of Labor and Employment (DOLE), the Occupational Safety and Health Center (OSHC), and other government agencies. These policies establish standards for protecting workers, promoting safe working environments, and ensuring compliance with occupational health and safety requirements (Lu, 2022).

The Department of Public Works and Highways (DPWH) plays a critical role in planning, constructing, and maintaining national infrastructure, including roads, bridges, and flood control projects. The DPWH Isabela Second District Engineering Office was established to oversee infrastructure development within its jurisdiction and has undergone organizational changes following the reapportionment of Isabela into six legislative districts. The district office continues to manage an extensive road network and contributes significantly to the development and maintenance of transportation infrastructure in the region (Medrano, 2020; Navarro & Latigar, 2023; DPWH, 2023).

4. Methods

4.1. Research Design

The research design of the study is descriptive comparative. This method is deemed appropriate for it enables the researcher to identify differences in trends, behaviors, or conditions about safety compliance and hazards experienced by civil engineers in DPWH Isabela 2nd DEO across distinct demographic profile.

4.2. Study Site and Participants

Eight (8) municipalities namely, Aurora, Burgos, Luna, Mallig, Quezon, Quirino, Roxas, and San Manuel, where projects are in Isabela's 5th Congressional District, under the area coverage of DPWH Isabela's 2nd DEO, serve as the basis for the assessment of safety compliance and hazard experienced by the engineers.

4.3. Population, Sample Size, and Sampling Method

The study population includes 55 respondents: 15 project engineers, 18 project inspectors/field engineers, 12 material engineers, and 10 planning and design engineers. Stratified random sampling was used to obtain a total of 49 respondents for the study, comprising 13 from project engineers, 16 from project inspectors/field engineers, 11 from material engineers, and 9 from planning and design engineers. This method involves intentionally selecting informants based on their ability to elucidate a specific theme, concept, or phenomenon.

4.4. Data Analysis

- Frequency and percentage were used to determine the demographic profile of the participants.
- Mean was used to determine the level of safety compliance of the civil engineers and was interpreted using the following scale:

Range	Qualitative Description
	Safety compliance
1-1.75	Fully noncompliant
1.76-2.75	Noncompliant
2.76-3.5	Neither compliant nor noncompliant
3.51-4.25	Compliant
4.26-5	Fully Compliant

- 3. One-way Analysis of Variance (ANOVA) was used to determine whether there is a significant difference in the level of safety compliance when grouped according to their age, years of service, and area of assignment.

- Independent Sample T-test was used to determine whether there is a significant difference in the level of safety compliance when grouped according to their sex, highest educational attainment, and number of years of service.

5. Results

5.1. Part 1 Demographic profile of respondents

Table 1 Demographic Profile of the Civil Engineers in the DPWH, Isabela Second District Engineering Office

Particular	Frequency	Percentage (%)
Age		
Below 25 y/o	2	4.08
25 – 34 y/o	33	67.35
35 – 44y/o	7	14.29
45 – 54 y/o	3	6.12
55 y/o and above	4	8.16
Total	49	100
Sex		
Male	35	71.43
Female	14	28.57
Total	49	100
Highest educational attainment		
College graduate	40	81.63
Postgraduate	9	18.37
Total	49	100
Number of years of service		
Below 5 years	13	26.53
5 – 10 years	21	42.86
11 – 15 years	7	
Particular	Frequency	Percentage (%)
Number of years of service		
16 – 20 years	2	4.08
20 years and above	6	12.24
Total	49	100
Area of Assignment		
Material Engineer	11	22.45
Planning & Design	9	18.37
Project Engineer	13	26.53
Project Inspector/Field Engineer	16	32.65
Total	49	100

Table 1 presents the demographic profile of civil engineers at the DPWH Isabela Second District Engineering Office. Questionnaires were distributed to a total of forty-nine (49) respondents. Among these respondents, thirty-five (35) are male, accounting for 71.43%, while sixteen (16) are female, making up 28.57%.

In terms of age distribution, two (2) respondents are under 25 years old (4.08%), thirty-three (33) respondents are between 25 and 34 years old (67.35%), seven (7) respondents fall within the 35 to 44 age range (14.29%), three (3) respondents are aged 45 to 54 (6.12%), and four (4) respondents are between 55 years old and above (8.16%).

In terms of highest educational attainment, forty (40) respondents (81.63%) are college graduates, and nine (9) respondents (18.37%) have pursued postgraduate studies.

In terms of years of experience, thirteen (13) respondents have less than 5 years of experience (26.53%), twenty-one (21) respondents have 5-10 years of experience (42.86%), seven (7) respondents have 11-15 years of experience (14.29%), two (2) respondents have 16-20 years of experience (4.08%), and six (6) respondents have more than 20 years of experience (12.24%).

In terms of area of assignment, sixteen (16) respondents (32.65%) belong to project inspector/field engineer, thirteen (13) respondents belong to project engineer (26.53%), eleven (11) respondents belong to material engineer (22.45%), and nine (9) respondents belong to (18.37%) belong to planning and design.

5.2. Part 2. Level of Safety Compliance of the Civil Engineers in the DPWH, Isabela Second District Engineering Office

This part shows the level of safety compliance among the civil engineers of the DPWH Isabela 2nd DEO in terms of: hazard identification and risk assessment, personal protective equipment, safety training and awareness, site safety plan management, accident prevention measures, legal and regulatory compliance, emergency preparedness and response, health monitoring and medical surveillance, safety signage and communication, and behavioral safety and culture.

5.2.1. Hazard Identification and Risk Assessment

Table 2 shows the level of safety compliance among the civil engineers of the DPWH Isabela 2nd DEO in terms of hazard identification and risk assessment.

Table 2 Level of Safety Compliance among the Civil Engineers in the DPWH, Isabela Second District Engineering Office, in terms of Hazard Identification and Risk Assessment

Hazard Identification and Risk Assessment		Mean	Interpretation
1.	Risk assessments are conducted for all identified hazards, including routine and non-routine activities	4.02	Compliant
2.	A documented process for the ongoing identification of workplace hazards has been established.	3.95	Compliant
3.	Risk assessments consider all persons in the workplace (employees, contractors, visitors)	4.05	Compliant
4.	Control measures are implemented based on the hierarchy of controls (elimination, substitution, engineering, administrative, PPE)	4.02	Compliant
5.	Risk assessments are reviewed and updated regularly or when there is a significant change	3.93	Compliant
6.	The findings of the risk assessment are communicated to all affected employees	3.95	Compliant
7.	Effective control measures are being verified for their effectiveness	3.95	Compliant
8.	The action plan to eliminate/reduce the risk is specific, measurable, achievable, realistic, and time-bound	4.09	Compliant
Category Mean		4.00	Compliant

As shown in Table 2, the level of safety compliance among the civil engineers in the DPWH, Isabela Second District Engineering Office is compliant in terms of hazard identification and risk assessment in all aspects. With a category mean of 4.00, this implies that the level of safety compliance among the civil engineers in the DPWH Isabela Second District Engineering Office is compliant in terms of hazard identification and risk assessment.

5.2.2. Personal Protective Equipment

Table 3 shows the level of safety compliance among the civil engineers of the DPWH Isabela 2nd DEO in terms of personal protective equipment.

Table 3 Level of Safety Compliance among the Civil Engineers in the DPWH, Isabela Second District Engineering Office, in terms of Personal Protective Equipment

Personal Protective Equipment		Mean	Interpretation
1.	Wearing of the equipment, protective device, or clothing by the employee is consistently enforced	3.53	Compliant
2.	Employees properly instructed in the need for and use, cleaning, and maintenance of personal protective equipment	3.79	Compliant
3.	Issuance of personal protective equipment to employees recorded	3.86	Compliant
4.	Written procedure that enables a supervisor to take disciplinary action for violation of established protective equipment standards	3.74	Compliant
5.	Items of personal protective equipment are regularly maintained and in good condition	3.77	Compliant
6.	The selected PPE provides adequate protection against the specific hazard identified	3.91	Compliant
7.	All necessary PPE fits together comfortably and effectively without compromising the protection of each individual item	3.88	Compliant
Category Mean		3.78	Compliant

As shown in Table 3, the level of safety compliance among the civil engineers in the DPWH, Isabela Second District Engineering Office is compliant in terms of personal protective equipment in all aspects. With a category mean of 3.78, this implies that the level of safety compliance among the civil engineers in the DPWH Isabela Second District Engineering Office is compliant in terms of personal protective equipment.

5.2.3. Safety Training and Awareness

Table 4 shows the level of safety compliance among the civil engineers of the DPWH Isabela 2nd DEO in terms of safety training and awareness.

Table 4 Level of Safety Compliance among the Civil Engineers in the DPWH, Isabela Second District Engineering Office, in terms of Safety Training and Awareness

Safety Training and Awareness		Mean	Interpretation
1.	Employees are aware of the company's overall Safety and Health Policy	3.95	Compliant
	Safety Training and Awareness	Mean	Interpretation
2.	Safety is treated as a top priority by management	4.07	Compliant
3.	Employees received all the necessary safety training to perform their jobs safely	3.58	Compliant
4.	The safety training received was easy to understand and engaging	3.72	Compliant
5.	Employees received adequate refresher training on safety topics	3.56	Compliant
6.	Employees know where to find the safe work procedures for their task	3.86	Compliant

7.	There is an adequate number of bulletin boards for safety and health/loss prevention purposes	3.63	Compliant
8.	Safety bulletin boards are located so that every employee has an opportunity to see at least once during the working day	3.70	Compliant
Category Mean		3.76	Compliant

As shown in Table 4, the level of safety compliance among the civil engineers of the DPWH Isabela Second District Engineering Office in terms of safety training and awareness in all aspects. With a category mean of 3.76, this implies that the level of safety compliance among the civil engineers in the DPWH Isabela Second District Engineering Office is compliant in terms of safety training and awareness.

5.2.4. Site Safety Plan Management

Table 5 shows the level of safety compliance among the civil engineers of the DPWH Isabela 2nd DEO in terms of site safety plan management.

Table 5 Level of Safety Compliance among the Civil Engineers in the DPWH, Isabela Second District Engineering Office, in terms of Site Safety Plan Management

Site Safety Plan Management		Mean	Interpretation
1.	There is a formal, written site safety plan specific to the project/site	3.72	Compliant
2.	The site safety plan was developed before work commenced on the site	3.77	Compliant
3.	There is a clear process for developing, reviewing, and approving the site safety plan	3.67	Compliant
4.	Key personnel are involved in the development of the site safety plan	3.79	Compliant
5.	The site safety plan was aligned with the existing OSH policies and procedures in the country	4.05	Compliant
6.	The site safety plan includes a comprehensive project/site description and scope of work	3.91	Compliant
7.	Project-specific OSH objectives and performance targets are clearly defined	3.93	Compliant
8.	There is a clear site organization chart defined OSH roles, responsibilities, and accountabilities	3.77	Compliant
Category Mean		3.83	Compliant

As shown in Table 5, the level of safety compliance among the civil engineers in the DPWH, Isabela Second District Engineering Office is compliant in terms of site safety plan management in all aspects. With category mean of 3.83, this implies that the level of safety compliance among the civil engineers in the DPWH Isabela Second District Engineering Office is compliant in terms of site safety plan management.

5.2.5. Accident Prevention Measures

Table 6 shows the level of safety compliance among the civil engineers of the DPWH Isabela 2nd DEO in terms of accident prevention measures.

As shown in Table 6, the level of safety compliance among the civil engineers in the DPWH, Isabela Second District Engineering Office is compliant in terms of accident prevention measures in all aspects. With a category mean of 3.70, this implies that the level of safety compliance among the civil engineers in the DPWH Isabela Second District Engineering Office is compliant in terms of accident prevention measures.

Table 6 Level of Safety Compliance among the Civil Engineers in the DPWH, Isabela Second District Engineering Office, in terms of Accident Prevention Measures

Accident Prevention Measures		Mean	Interpretation
1.	Formal risk assessments have been conducted for all significant tasks and processes in the area	3.63	Compliant
2.	Findings of risk assessment are communicated effectively to all affected employees	3.65	Compliant
3.	There is a clear process for developing, reviewing, and approving the site safety plan	3.79	Compliant
4.	All employees receive formal safety induction training before starting work	3.53	Compliant
5.	All accidents, incidents, and near misses are investigated promptly and thoroughly	3.91	Compliant
6.	Corrective actions from investigations are tracked to ensure they are implemented	3.84	Compliant
Accident Prevention Measures		Mean	Interpretation
7.	There are regular safety committee meetings or toolbox talks with employee representation	3.60	Compliant
8.	Positive and constructive feedback is provided for safe behaviors	3.67	Compliant
Category Mean		3.70	Compliant

5.2.6. Legal and Regulatory Compliance

Table 7 shows the level of safety compliance among the civil engineers of the DPWH Isabela 2nd DEO in terms of legal and regulatory compliance.

Table 7 Level of Safety Compliance among the Civil Engineers in the DPWH, Isabela Second District Engineering Office, in terms of Legal and Regulatory Compliance

Legal and Regulatory Compliance		Mean	Interpretation
1.	Resources (people, time, budget) are adequately allocated to meet OSH objectives and legal requirements	3.81	Compliant
2.	The organization established a process to identify, track, and have access to all accessible OSH legal requirements (national, provincial/local)	3.81	Compliant
3.	The process for reviewing legal requirements is documented regularly	3.72	Compliant
4.	Other requirements (standards, industry guidelines, contractual obligations) are identified and tracked	3.74	Compliant
5.	Relevant legal and other requirements are communicated to affected personnel	3.91	Compliant
Category Mean		3.80	Compliant

As shown in Table 7, the level of safety compliance among the civil engineers in the DPWH, Isabela Second District Engineering Office is compliant in terms of legal and regulatory compliance in all aspects. With a category mean of 3.92, this implies that the level of safety compliance among civil engineers in the DPWH Isabela Second District Engineering Office is compliant in terms of legal and regulatory compliance.

5.2.7. Emergency Preparedness and Response

Table 8 shows the level of safety compliance among the civil engineers of the DPWH Isabela 2nd DEO in terms of emergency preparedness and response.

Table 8 Level of Safety Compliance among the Civil Engineers in the DPWH, Isabela Second District Engineering Office, in terms of Emergency Preparedness and Response

Emergency Preparedness and Response		Mean	Interpretation
1.	The coordinator administers the overall emergency plan and has been appointed in writing	3.93	Compliant
2.	There is a comprehensive emergency plan in writing	3.77	Compliant
3.	There are well-documented, detailed instructions for each department, building, or area that include fire, work shutdown & other emergency procedures	3.93	Compliant
4.	The records indicate an adequate number of training drills, such as work shutdowns, fire drills, & emergency tests, being conducted are in accordance with good emergency preparedness	4.05	Compliant
5.	Emergency lighting and power are adequate & do they meet legislated requirements where applicable	3.98	Compliant
6.	Emergency lighting & power are tested in accordance with recommended practices & legislated requirements, with results recorded & defects immediately repaired	4.02	Compliant
7.	Personnel are familiar with the location and shut-off procedures of all master controls	3.88	Compliant
8.	There is a machinery and equipment lock-out policy and procedure (and zero energy state if applicable to the situation) in writing and included in emergency procedures	3.70	Compliant
Category Mean		3.91	Compliant

As shown in Table 8, the level of safety compliance among the civil engineers in the DPWH, Isabela Second District Engineering Office is compliant in terms of emergency preparedness and response in all aspects. With a category mean of 3.91, this implies that the level of safety compliance among civil engineers in the DPWH Isabela Second District Engineering Office is compliant in terms of emergency preparedness and response.

5.2.8. Health Monitoring and Medical Surveillance

Table 9 shows the level of safety compliance among the civil engineers of the DPWH Isabela 2nd DEO in terms of health monitoring and medical surveillance.

Table 9 Level of Safety Compliance among the Civil Engineers in the DPWH, Isabela Second District Engineering Office, in terms of Health Monitoring and Medical Surveillance

Health monitoring and medical surveillance		Mean	Interpretation
1.	The office identified any potential health conditions that could be affected by your workplace exposures	3.93	Compliant
2.	The office ensured the employees' fitness for specific job tasks	3.88	Compliant
3.	The office established a baseline of employees' health for future comparison	3.86	Compliant
4.	The office complied with relevant occupational health and safety regulations	3.95	Compliant
Category Mean		3.91	Compliant

As shown in Table 9, the level of safety compliance among the civil engineers in the DPWH, Isabela Second District Engineering Office is compliant in terms of health monitoring and medical surveillance in all aspects. With a category mean of 3.91, this implies that the level of safety compliance among civil engineers in the DPWH Isabela Second District Engineering Office is compliant in terms of health monitoring and medical surveillance.

5.2.9. Safety Signage and Communication

Table 10 shows the level of safety compliance among the civil engineers of the DPWH Isabela 2nd DEO in terms of safety signage and communication.

Table 10 Level of Safety Compliance among the Civil Engineers in the DPWH, Isabela Second District Engineering Office, in terms of Safety Signage and Communication.

Safety Signage and Communication		Mean	Interpretation
1.	Aware of the different types of safety signs used in the work area	4.26	Compliant
2.	Understand the meaning of all the safety symbols/pictograms seen on sign in the work area	4.16	Compliant
3.	Safety signs in the work area are clearly visible and free from obstruction	4.05	Compliant
4.	Safety signs are placed in locations where the hazard exists or where the instruction needs to be followed	4.02	Compliant
5.	The general condition of the safety signs is clean, legible, and undamaged	4.02	Compliant
6.	Emergency exit signs and evacuation route maps are clearly illuminated and visible in both normal and emergency lighting conditions	4.12	Compliant
7.	Instructions on the signs are easy to understand and follow	4.12	Compliant
8.	Employees were formally trained on the meaning of different safety signs and tags during orientation	3.81	Compliant
Category Mean		4.07	Compliant

As shown in Table 10, the level of safety compliance among the civil engineers in the DPWH, Isabela Second District Engineering Office is compliant in terms of safety signage and communication in all aspects. With a category mean of 4.07, this implies that the level of safety compliance among civil engineers in the DPWH Isabela Second District Engineering Office is compliant in terms of safety signage and communication.

5.2.10. Behavioral Safety and Culture

Table 11 shows the level of safety compliance among the civil engineers of the DPWH Isabela 2nd DEO in terms of behavioral safety and culture.

Table 11 Level of Safety Compliance among the Civil Engineers in the DPWH, Isabela Second District Engineering Office, in terms of Behavioral Safety and Culture

Behavioral Safety and Culture		Mean	Interpretation
1.	Management regularly communicates that safety is as important as production	4.07	Compliant
2.	My supervisor consistently follows the same safety rules that they expect from me	4.00	Compliant
3.	Management provides adequate resources (time, budget, equipment) to work safely	3.79	Compliant
4.	Safety goals are clearly defined and communicated by management	3.81	Compliant
5.	Employees are actively encouraged to participate in safety committees or meetings	4.02	Compliant
6.	Safety procedures for my tasks are clear, easy to understand, and readily available	4.02	Compliant
7.	The tools and equipment provided are well-maintained and safe to use	3.98	Compliant
8.	Housekeeping and workplace organization are consistently good in my area	4.00	Compliant
Category Mean		3.94	Compliant

As shown in Table 11, the level of safety compliance among the civil engineers in the DPWH, Isabela Second District Engineering Office is compliant in terms of behavioral safety and culture in all aspects. With a category mean of 3.94, this implies that the level of safety compliance among civil engineers in the DPWH Isabela Second District Engineering Office is compliant in terms of behavioral safety and culture.

5.2.11. Summary Table of Safety Compliance

Table 12 presents a summary of the level of safety compliance among the civil engineers of the DPWH Isabela 2nd DEO.

Table 12 Summary of the Level of Safety Compliance among the Civil Engineers in the DPWH, Isabela Second District Engineering Office

Safety Compliance		Mean	Interpretation
1.	Hazard identification and risk assessment	4.00	Compliant
2.	Personal protective equipment	3.78	Compliant
3.	Safety training and awareness	3.76	Compliant
4.	Site safety plan management	3.83	Compliant
Safety Compliance		Mean	Interpretation
5.	Accident prevention measures	3.70	Compliant
6.	Legal and regulatory compliance	3.80	Compliant
7.	Emergency preparedness and response	3.91	Compliant
8.	Health monitoring and medical surveillance	3.91	Compliant
9.	Safety signage and communication	4.07	Compliant
10.	Behavioral safety and culture	3.94	Compliant
Category Mean		3.87	Compliant

As shown in Table 12, the summary of the level of safety compliance among the civil engineers in the DPWH, Isabela Second District Engineering Office is compliant in all aspects with a category mean of 3.87, this implies that the summary of the level of safety compliance among civil engineers in the DPWH Isabela Second District Engineering Office is compliant.

5.3. Part 3. Test of Significant Difference in the Level of Safety Compliance when grouped according to their Demographic Profile

5.3.1. Age

Table 13 presents the differences in level of safety compliance among civil engineers of the DPWH Isabela 2nd DEO, grouped by their age.

Table 13 Test of Significant Difference in the Level of Safety Compliance among Civil Engineers of the DPWH Isabela 2nd DEO, grouped by their Age

Age Group	N	M	SD	df	F	P-value
Below 25 y/o	2	3.69	0.32	48	1.08	0.38
25 – 34 y/o	33	3.87	0.46			
35 – 44 y/o	7	3.81	0.54			
45 – 54 y/o	3	3.34	1.33			
55 and above y/o	4	4.21	0.77			

Using the one-way analysis of variance (ANOVA), it determines the differences in the level of safety compliance by age group. The results revealed no statistically significant effect of age group on the level of safety compliance, $F(4, 48) = 1.08$, $p = 0.38$, $\alpha = 0.05$.

5.3.2. Sex

Using the Independent sample t-Test, it determines the differences in level of safety compliance by sex groups. Results show no significant difference on respondents' level of safety compliance across sex groups at the 0.05 level of significance.

5.3.3. Highest Educational Attainment

Using the Independent sample t-Test, it determines the differences in the level of safety compliance by the highest educational attainment groups. Results show no significant difference on respondents' level of safety compliance when grouped by highest educational attainment at the 0.05 level of significance.

5.3.4. Number of Years of Service

Using the one-way analysis of variance (ANOVA), it determines the differences in the level of safety compliance by age group. The results revealed no statistically significant effect of age group on the level of safety compliance, $F(4, 48) = 0.34$, $p = 0.85$, $\alpha = 0.05$.

5.3.5. Area of Assignment

Using the one-way analysis of variance (ANOVA), it determines the differences in the level of safety compliance by age group. The results revealed no statistically significant effect of age group on the level of safety compliance, $F(4, 48) = 1.00$, $p = 0.40$, $\alpha = 0.05$.

5.4. Proposed Measures to Improve Occupational Safety Compliance

The proposed measures to improve occupational safety compliance are the following: Increase the frequency of site walk-throughs, supervision, and inspections; Encourage employees to participate in safety talks/meetings; Design OSH strategies to cover all workers; Promote a strong safety culture; Strict implementation of RA 11058; Improve safety processes and procedures; Regular updating of occupational and safety policies; Regular updating of hazard identification and risk assessment, and control measures; Improve coordination and communication; and Integrate safety in all programs, plans, and activities.

Table 18 Proposed Measures to Improve Occupational Safety Compliance

Proposed Measures	No. of Responses	Rank
1. Increase the frequency of site walk-throughs, supervision, and inspections	35	1
2. Encourage employees to participate in safety talks/meetings	33	3
3. Design OSH strategies to cover all workers	28	7
4. Promote a strong safety culture	35	1
5. Strict implementation of RA 11058	31	4
6. Improve safety processes and procedures	21	9
7. Regular updating of occupational and safety policies	23	8
8. Regular updating of hazard identification and risk assessment, and control measures	19	10
9. Improve coordination and communication	31	4
10. Integrate safety in all programs, plans, and activities	30	6

Out of the ten (10) proposed measures to improve occupational safety compliance, Increase the frequency of site walk-throughs, supervision, and inspections and promote a strong safety culture tied at first, followed by Encourage

employees to participate in safety talks/meetings at third; Strict implementation of RA 11058 and Improve coordination and communication at fourth, integrate safety in all programs, plans, and activities ranked at sixth. Design OSH strategies to cover all workers, ranked seventh. Regular updating of occupational and safety policies and improve safety processes and procedures ranked eighth and ninth, respectively. Regular updating of hazard identification and risk assessment, and control measures ranked as the last among the proposed measures to improve occupational safety compliance.

6. Conclusion

The study presents several key findings regarding safety compliance among civil engineers in the Isabela Second District Engineering Office of the Department of Public Works and Highways (DPWH):

- The majority of the respondents are male, aged 25-34 years old, college graduates, and with 5-10 years of service in the agency.
- The level of safety compliance among the civil engineers in the DPWH, Isabela Second District Engineering Office, is compliant in all aspects.
- There is no significant difference in the perception of the respondents when grouped according to their demographic profile in terms of sex, age, educational attainment, number of years of service, and area of assignment.

The proposed measures to improve the safety compliance are the following: Integrate safety in all programs, plans, and activities; Promote a strong safety culture; Encourage employees to participate in safety talks/meetings; Design OSH strategies to cover all workers; Strict implementation of RA 11058; Improve coordination and communication; Integrate safety in all programs, plans, and activities; Design OSH strategies to cover all workers; Regular updating of occupational and safety policies; Improve safety processes and procedures; and Regular updating of hazard identification and risk assessment, and control measures.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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