2025 SAFETY AND HEALTH MANAGEMENT REPORT

HD HYUNDAI HEAVY INDUSTRIES

2025 HD HYUNDAI HEAVY INDUSTRIES SAFETY AND HEALTH MANAGEMENT REPORT

This is the annual "report of HD Hyundai Heavy Industries ("HD HHI") on safety and health management", issued to disseminate the value of Safety First ("S1") management and contribute to the spread of the safety culture and communication by providing stakeholders, as well as all employees, with broader understanding and information on overall activities in safety and health. HD HHI will continue to share and communicate its safety vision, the implementation progress of its business plans, and the results thereof.

FUTURE BUILDER

A Brighter Future for All

CORE VALUE

World-leading Innovation

We innovate the way we work through creative thinking. We lead industrial innovation with future technology.

Challenges without Fear

We create new value by constantly pushing boundaries. We foster a culture that embraces failure and faces challenges without fear.

Mutual Respect

We value diversity and promote open communication. We value and support the development of our employees. We fulfill our corporate responsibility to build a better world.

Safety for All

We are committed to the highest safety standards. We promote the safety of our customers, society, and people through safe products and services.

HD HHI aims to be a “future builder,” creating new values for humanity beyond being the world’s best shipyard, based on four core values and standards—"World-leading Innovation," "Challenges without Fear," "Mutual Respect," "Safety for All."

SAFETY FOR ALL

HD HHI is committed to the highest safety standards.
We promote the safety of our customers, society, and people through safe products and services.

Introduction to HD HHI Business Units

SHIPBUILDING BUSINESS UNIT

HD Hyundai Heavy Industries builds various types of large vessels using its ten construction docks and nine Goliath cranes.
HD HHI, a leader in the world's shipbuilding industry, achieved the world's No. 1 ranking in shipbuilding volume within 10 years of its establishment and has delivered more than 2,300 ships to about 350 shipping companies in 52 countries since 1972.

OFFSHORE AND ENERGY BUSINESS UNIT

With one 10,000-ton heavy lifting vessel, two 1,600-ton Goliath cranes, and one one-million-ton construction dock, we work on projects including design, procurement, fabrication, transportation, installation, and commissioning services for various types of fixed and floating production facilities. In addition, we are engaged in various renewable energy businesses such as offshore wind power generation facilities, carbon capture and storage devices, hydrogen energy development, the international thermonuclear experimental reactor, and small modular reactors.

NAVAL & SPECIAL SHIP BUSINESS UNIT

HD HHI employs professionals, state-of-the-art facilities, and cutting-edge technology for naval and special ship construction. With advanced technology, we have independently designed and built a 10,000-ton state-of-the-art Aegis destroyer and a 3,000-ton multi-purpose frigate for the Republic of Korea Navy and have worked on the next-generation destroyer and submarine construction projects. We are also leading the defense industry export sector by building logistic support vessels for the New Zealand Navy, designing and building state-of-the-art frigates for the Philippine Navy, and modernizing Peruvian Navy vessels.

ENGINE & MACHINERY BUSINESS UNIT

HD HHI is the world's largest engine manufacturer, accounting for around 35% of the global 2-stroke engine market. In addition to ship propulsion and power generation engines, we supply high-quality marine eco-friendly products to the global market. For HiMSEN engines, following the development of LNG and methanol fuel engines, we are currently developing ammonia and hydrogen engines for zero carbon emissions.

PART. 1

Safety and Health Policy

HD HYUNDAI
HEAVY INDUSTRIES

Safety Message from the CEO and CSO

"Safety First": Let's uphold our basic principles and standards

Last year, all of us at HD HHI made continuous efforts to create a safe workplace.
We have established a "safety management system of selection and focus" for high risk work, including mobile safe work orders, on-site risk assessment, the permit to work (PTW) program, and triple safety checks. Nevertheless, we deeply regret the unfortunate accidents that occurred in our workplace last year.

"There is not a single task in our company that is important enough to get injured while doing it."

We must constantly learn and train to make "safety first" decisions in any situation, not just in emergencies, and consciously strive to be safe.
The production departments should plan the work in advance, the supervisor should clearly instruct the workers about the work, and the triple management system subjects should check and inspect this at the site. This basic principle must be maintained as we monitor various processes and provide feedback in real-time through the integrated HSE management computerized system (Hi-SEs).

Safety is not just in our workers' hands. From the moment they arrive until the moment they leave, all employees should feel "safe."

To achieve this, we will maintain and develop our unique safety culture, such as the "Safety Golden Rules," while actively promoting activities to build individual safety capabilities.
Please uphold your commitment to safe work practices. Before starting work, make sure you are properly wearing safety equipment. Check the work details for the day, evaluate what risks exist, and start work only after thorough preparation.
In particular, please focus your management capabilities on ensuring that the actions agreed upon for the "safety of all" are followed and strive to prevent and fundamentally improve risk factors while managing various volatilities in the field.

The "safety first" principle must be consistently applied to all subcontractors and foreign workers.

There should be no exceptions when it comes to safety. Subcontractor employees must also share our most important value of "safety" and foster a culture to turn it into reality. Foreign workers are also valuable members of HD HHI. We ask for your continued interest and support so that they can build a safe workplace together with pride and build your capabilities on a continued basis. Your growth and safety are our competitiveness.
The company will proactively prepare practical and systematic programs for stabilizing the manpower supply of subcontractors, providing technical guidance and training, and establishing sound management and fair trade to strengthen trust with subcontractors and further promote shared growth.
In addition, we will provide detailed support for both the work environment and living areas so that foreign workers can work safely at the company and achieve their aspirations.

Dear HD HHI colleagues,
The safety of all is directly linked to the happiness of our employees and their families.

Safety is our core value that we will never compromise. Only when everyone works together with one heart can true results and changes be achieved. Let's strengthen our resolve together to allow no fatality accidents this year. Let's ensure that everyone stay safe and happy. Through these efforts, I hope we can make 2025 truly our year. I expect all employees to practice the principle of "safety first" throughout the year and to take a leap forward as an even more trusted HD HHI.

Lee Sang-kyun, President
HD HHI CEO

Noh Jin-yul, President
HD HHI CEO
Chief Safety Officer (CSO)

2025 Health, Safety, and Environment Policies and Objectives

HD HHI aims to achieve a "workplace where everyone is safe" this year, establishing a safety-first culture across all sectors, and strengthening responsibility management and self-regulated safety management system led by the production departments. In particular, we plan to build a smart and safe working environment using Digital Transformation (DT) technology and introduce a more systematic and efficient safety management system through advanced technology. Based on these efforts, we will complete a prevention-centered safety system and create an advanced safety culture that eliminates risk factors in advance. Based on the active participation and practice of all employees, we will continue to strive to not only achieve safety goals but also establish a safety culture that upholds basic principles and standards.

2025 Health, Safety, and Environment Policies

In the firm belief that nothing is more important than life, management and labor ensure employees and stakeholders know that Health, Safety, and Environment (HSE) practices are a top priority.

1. A workplace where everyone is safe

- Creating a safety-first culture in all divisions
- Building a production-led responsibility and self-regulated safety management system
- Creating a DT-based smart, safe working environment

2. A pleasant and healthy workplace

- Establishing prevention-focused health management system operation
- Building a healthy workplace through hazardous chemical management

3. Enhancing an eco-friendly corporate culture

- Realizing green growth through low-carbon, green management
- Establishing an environmental pollution prevention and legal compliance system

Chief Executive Officer **Lee Sang-kyun** 이 상 균

Chief Executive Officer **Noh Jin-yul** 노 진 율

2025 Health, Safety, and Environment Objectives

Safe Workplace Aligned with the Basic Principles and Standards

Accomplishing the objectives of zero fatality accidents and an accident rate of 0.155 or less

- Establishing clear safety standards for compliance with basic principles and standards
- Advancing the on-site inspection feedback system for meaningful safety activities
- Improving employee safety capability with Safe Career Path
- Strengthening risk response capabilities through improvement of the enterprise-wide emergency response system
- Expanding the total solution system for supporting in-house and external subcontractors

Achieving a prevention-oriented health management system

- Establishing an integrated health management support system
- Reinforcement of post-health examination management and fostering a culture to promote health
- Enhancing health indicator management system

Implementing a sustainable environmental management system

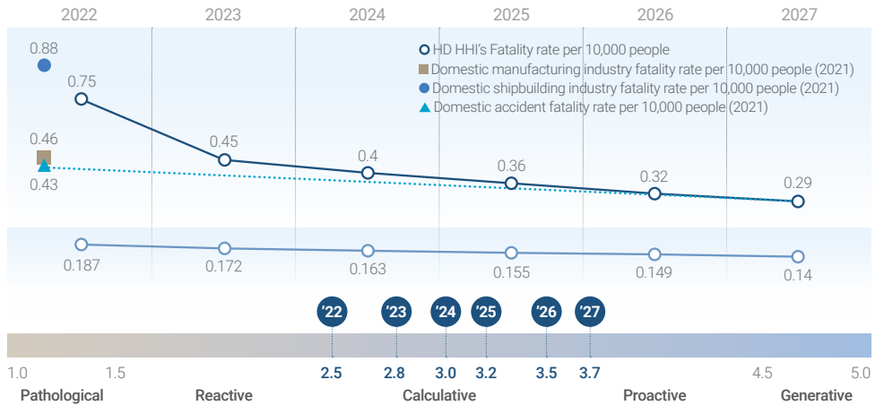
- Responding to climate change through green management system implementation
- Strengthening green management by advancing the environmental management system

HD HHI's Key Safety Policy Implementations

HD HHI declared "Safety Vision 2027" in 2023 with the goal of realizing "a workplace where everyone is safe" and "a company where safety is its brand," which we have been systematically implementing ever since. This vision consists of safety goals, implementation strategies, and key promotion points for the next five years, and we have been faithfully implementing them according to our roadmap of short-term and long-term implementation plans.
In 2025, we will focus on improving the efficiency of our risk assessment system. We also plan to focus on building a field-oriented risk management system that identifies risk factors in advance through periodic, ad-hoc, and on-site risk assessments and strengthens inspection and monitoring of high risk works. In terms of culture, we plan to build on and advance our "Safety Career Path" to systematically develop and manage safety capabilities tailored to the roles of all employees. In terms of technology, we plan to improve the reliability of our existing accident prediction systems and strengthen the operation of data-based risk management systems.

Safety Vision 2027

Vision	A workplace where everyone is safe, a company where safety is its brand		
Objective	**Accident rate** below 0.15	**Fatality rate per 10,000 people** below 0.29	**Safety Culture Index** above 3.7
Strategy	**Establishing a self-regulated safety management system**	**Fostering a safety-first culture**	**Achieving smart safe workplaces**
Key promotion tasks	Engaging in safety and health activities based on risk assessment Securing the operability of the self-regulated safety management system	Upgrading the safety culture level Upgrading the safety capabilities of all members	Advancing the big data-based prediction system Implementing an AI-based safety monitoring system



PART. 2

Organization, Members, and Roles of the Safety and Health Management Group

HD HYUNDAI
HEAVY INDUSTRIES

Roles and Responsibilities of the Safety Division

HD HHI's Corporate Safety and Health Office consists of the Corporate Safety Department / Corporate Safety and Health Support Department and the Safety Departments of each Business Unit. The former organizations plan enterprise-wide safety and health policies and systems, operate the HSE management system, manage incident and accident statistics, and deal with labor-management and government relations, while the latter performs the line function, such as planning and implementing safety for Business Units, investigating accidents, establishing countermeasures, and managing on-site safety.

Corporate Safety Department

Safety Planning Section

- Safety policy-making, system planning, and business planning
- Implementation and operation of the safety and health management system
- Safety and health management systems (ISO 45001)
- Safety standards and guidelines
- Safety Leading Indicators (SLI)
- Integrated HSE Management Computerized System (Hi-SEs)
- Risk assessment (HI-STANDARD)
- Compliance with relevant laws (KEF, KOSHIPA)
- Operation of the Corporate Safety and Health Office

Safety Risk Management (SRM) Section

- Operation of safety big data and accident prediction systems
- Enterprise-wide safety improvement (Hi-SAFE) activities
- Risk finding and improvement
- Supporting the Design / Production / Production Support sections to improve safety
- Conducting safety-related Digital Transformation (DT) projects / Benchmarking external best practices

Safety Culture Section

- Planning and operation of safety training systems
- Building and operation of safety training management systems
- Development and implementation of safety training programs
- Development and implementation of educational content
- Planning and implementation of safety culture assessments
- Operational support for the Integrated Safety Training Center (ISTC) / Safety Experience Training Center (SETC)

Safety Inspection Section

- Inspection of enterprise-wide high risk process planning and improvement of site safety
- Taking immediate measures against site high risk factors (securing safety authority (SSA), reporting safety risks)
- Safety inspection for high risk work during vulnerable times
- Safety inspection and technical support for in-house/external subcontractors
- Inspection and improvement of compliance with safety-related laws and regulations
- Implementation and management of countermeasures against major accidents

Corporate Safety and Health Support Department

Safety Supporting Section

- Safety support tasks and system planning
- Government affairs and labor relations, regulatory compliance
- Hazardous machinery and equipment and safety inspection/certification management
- Fire prevention, hazardous substances licensing/inspection, site management
- Process safety management (PSM) and hazard prevention planning, safety licensing
- Disaster prevention and disaster response, integrated control center operations
- In-house traffic and installations safety management

Health Management Section

- Health policy and system planning
- Medical examinations and follow-up management
- Operation of occupational disease control and health promotion programs
- Working environment monitoring and improvement
- Chemical management
- Protective and personal equipment management
- Prevention and management of MusculoSkeletal Disorders (MSDs)

Safety Departments in Each Business Unit

Office Staff

Safety planning, operations, training, and shipowner/client relations

- Safety planning and safety and health training for Business Units
- Managing site high risk factors
- Assisting subcontractors in safety activities (meetings, etc.)
- Holding safety management meetings
- Shipowner/Client HSE affairs and business support activities
- Investigation of major accidents and establishment of countermeasures

Site Safety Supervisor

Site safety management

- Site safety walkarounds and improvements
- Permission and approval of dangerous works and on-site inspection
- Discipline for safety rule violations
- Emergency response
- Emergency response drills in different areas/situations

Safety Organization Chart

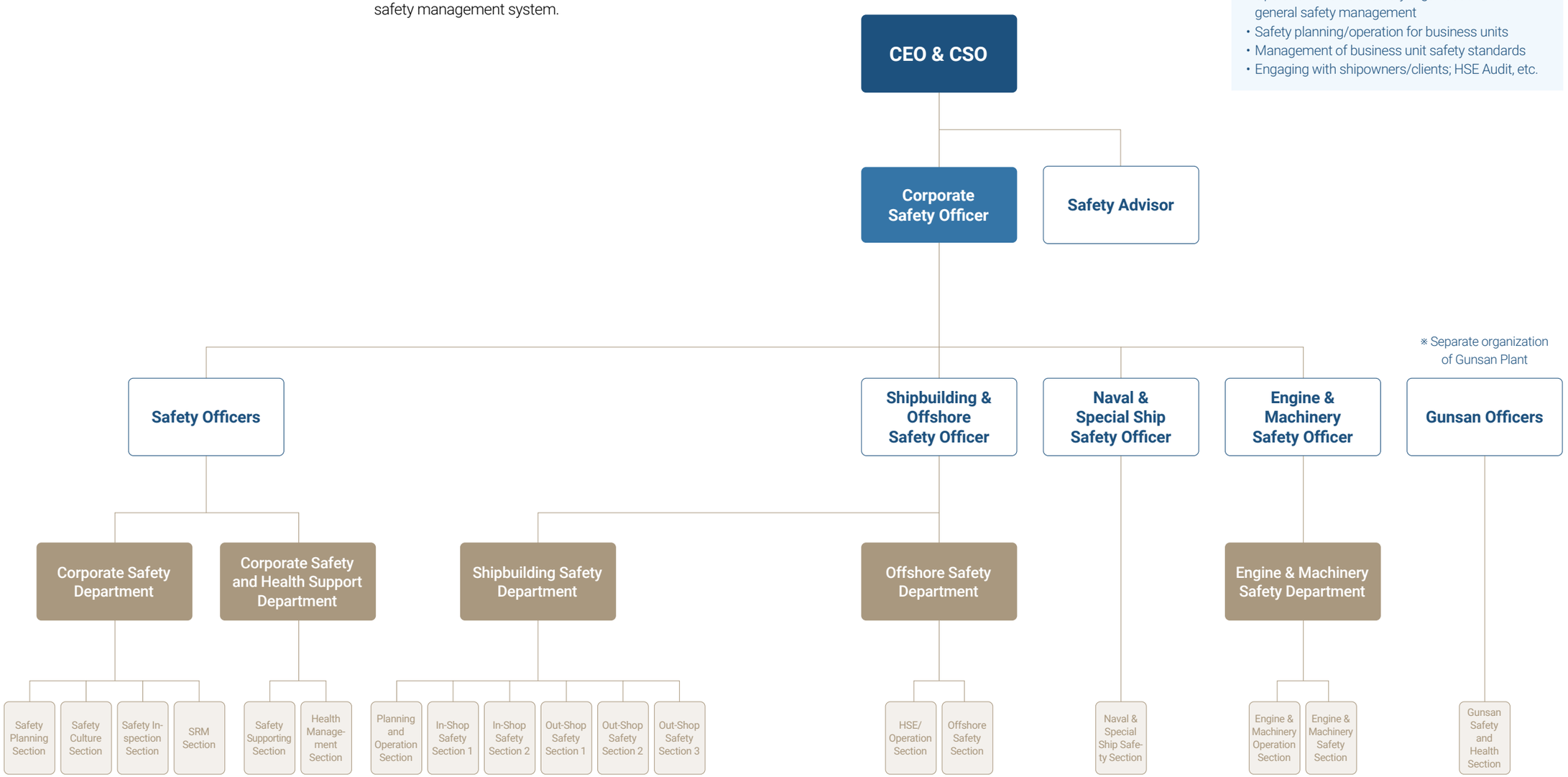
The Corporate Safety Department and the Corporate Safety and Health Support Department, which directly report to the CEO and CSO, act as the control tower for enterprise-wide safety and health management, develop enterprise-wide safety and health systems and policies, and respond to safety and health-related laws. The safety departments in each business unit conduct safety activities and inspections according to safety-related systems and policies. It also promotes safe workplaces through thorough site management and guidance aimed at establishing a production-oriented autonomous safety management system.

Corporate Safety Department / Corporate Safety and Health Support Department

- Enterprise-wide safety and health planning/operation; standard management
- Enterprise-wide safety improvement; site safety inspection
- Safety culture and safety training
- Engaging with the government/labor union/civil petitions

Safety Departments in Each Business Unit

- Operation of on-site safety organizations and general safety management
- Safety planning/operation for business units
- Management of business unit safety standards
- Engaging with shipowners/clients; HSE Audit, etc.



PART. 3

Safety and Health Budgets and Facilities

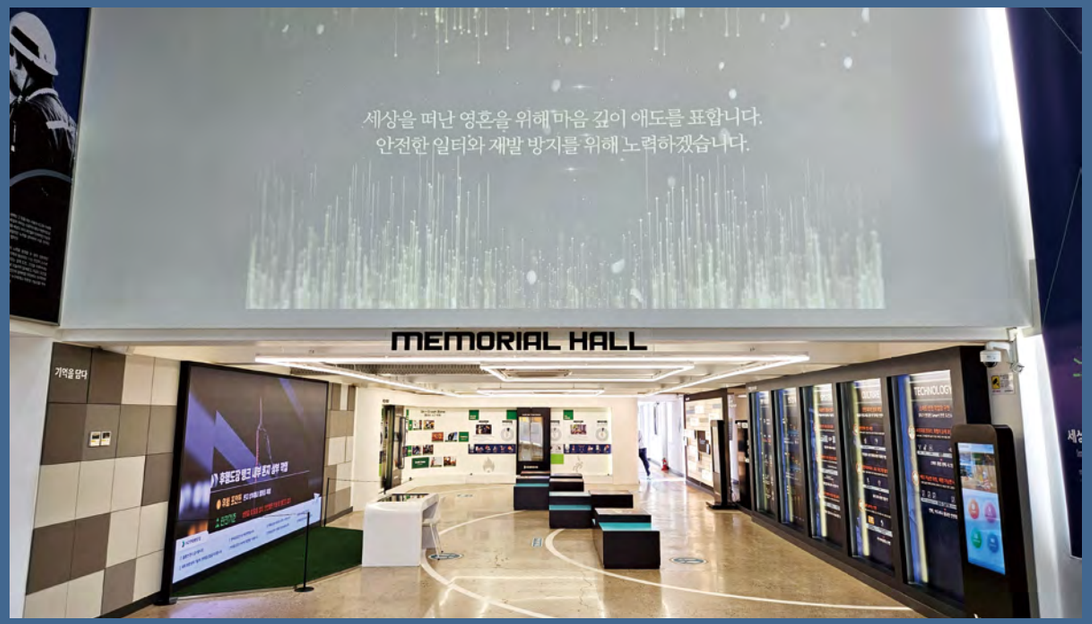
HD HYUNDAI
HEAVY INDUSTRIES

Safety and Health Budget Standards and Composition

Classification	Definition	Details
Personnel Costs	Safety personnel management costs and safety work allowances	**Human resources assigned to safety and health management** • Safety Division: Safety and health management staff, on-site safety supervisor • Production Division: Safe Clover • Subcontractors: Allowances to signalers for cranes, T/Ps, etc., safety supervisors, fire watchers, and confined-space watchers of subcontractors **Safety responsibility allowances for supervisors**
Personal Protective Equipment (PPE) / Safety Consumables	Statutory PPE and safety consumables to prevent safety accidents and health hazards	**Statutory PPE** • Hardhats, safety boots, masks, safety harnesses, safety glasses, earplugs **Other safety-related consumables** • Safety gloves, protective suits, face shields, heated vests, cooling jackets, cool sleeve protectors, ice jackets, fine-dust masks, etc. **Installation of safety facilities (sub-materials)** • Installation of safety guard rails, fall prevention nets, manhole covers, lifelines, ropes, ventilation fans, etc., and the cost of materials
Safety and Health Training	Direct costs for safety and health training	**Statutory safety and health training** • New employees / supervisors / workers (regular) / workers with altered assignments • Safety and Health Officer / Safety Manager / Health Manager • Special safety and health training / hazardous chemicals / MSDS **Internal safety and health training** • Newly appointed supervisors / returners / foreign workers / rule violators / traffic safety / Safety Academy • Safety and health training for union members / HSE promoters / leadership building for safety supervisors (including subcontractor safety managers) • Training on qualifications (for platforms, cranes, gondolas, forklifts, aerial work vehicles, etc.) **Other matters related to safety and health training** • Development of training programs, safety guidelines (manuals), booklets on safety-related statutes and regulations, fees for in-house safety instructors, etc.
Safety Incentives/ Events	Organization/ individual incentives and event costs	**Incentives to organizations for outstanding performance** • Outstanding departments / outstanding teams / outstanding subcontractors **Incentives to individuals** • Outstanding supervisors / outstanding subcontractor safety managers / outstanding safety supervisors / spot awards / event rewards **Safety events** • Safety events (safety risk contests, quiz contests, etc.), safety forums, etc.
Safety Assessment/ Consulting	Costs for safety and health assessments, tests, reviews, and consulting by external institutions	**Inspections, tests, and consulting on safety and health** • Inspections on safety and health (by an external institution or internally) • Certification/inspection of dangerous machines and instruments • HSE Management System (ISO 45001, ISO 14001) • Consulting on safety and health (PSM, firefighting, safety management of subcontractors, etc.) • Safety Innovation Advisory Committee
Health Promotion	Costs for health protection and promotion activities for workers	**Medical examinations** • General examinations / special examinations / comprehensive examinations / others (temporary, occasional examinations, etc.) **Health promotion** • Operation of the Total Health Promotion (THP) program, rehabilitation programs, smoking-cessation/obesity clinics • Prevention and control of infectious diseases, prevention and vaccinations of influenza, etc. • Operation of an in-plant hospital (outsourced) / local medical office, operation of the oriental medicine clinic, operation of ambulances **Workplace management** • Workplace environment measurements, local exhaust system (hazard prevention plan) inspections, etc. **Medical expense assistance, etc.** • Payment of medical benefits for injuries on duty; medical treatment of musculoskeletal disorders (MSDs) and incurable diseases; expenses for disinfection and sterilization; convenience facilities for hygiene and health, etc.
Safety Maintenance and Repair	Costs for maintaining and repairing major safety facilities and safety protection equipment	**Maintenance and repair of major safety systems and safety protection equipment (consumables)**
Safety Facility Investment	Investment in safety facilities, equipment, IT, and technology to prevent accidents and promote worker's health	**Investment in safety facilities and equipment to prevent accidents and protect health** • Adoption and purchase of safety facilities and equipment for accident prevention • Improvement of safety by replacing and repairing worn-out machines and equipment according to the results of safety and internal inspections of dangerous machines and equipment (such as cranes and working vehicles) • Expansion of medical facilities for health promotion; purchase of medical instruments and equipment; replacement of worn-out instruments and equipment • Purchasing, supplementing, and replacing firefighting / disaster prevention equipment • Emergency safety facilities investment, etc. **Investment in computer systems and technological development to prevent safety accidents** • Safety design programs (such as simulators), models for prediction of risks with DT, etc. • Development of technology for preventing accidents, such as a system for preventing collision of cranes/forklifts • Building, operating, and upgrading safety management programs, such as the integrated HSE management computerized systems (Hi-SEs)

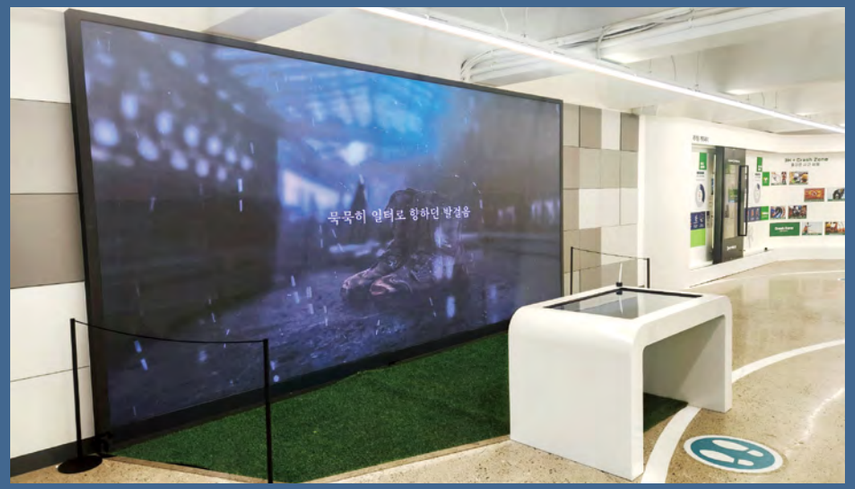
MEMORIAL HALL

HD HHI has established a memorial space in the lobby of the ISTC to honor and remember those who passed away due to industrial accidents in the past. An outdoor memorial sculpture entitled Memory-Harmony has been set up to commemorate the victims and strengthen the resolve of labor and management to create a safe workplace together.



Preserving the Memories

Created a space where visitors can watch memorial videos honoring victims and send messages of condolence



Remembering the Pain

Display the number of fatality accidents by type, the list of victims, and scenes from the accident sites at the time to help visitors empathize with the pain of the victims

Documenting the Past

Play informative video clips about key types of fatality accidents in the past, including accident information and safety rules

Current Safety and Health Facilities

Fire/Disaster Prevention Facilities

Safety Facilities Operation (fire/disaster prevention)

Classification	Current Status	Classification	Current Status
Fire extinguishers	23,500EA	Xenon searchlights	8EA
Fire hydrants	2,680EA	Smoke-penetrating lanterns	10EA
Automatic fire detection system	3,383 lines	Megaphones (portable)	4EA
Sprinklers	120 districts	Electric winches	10EA
Gas-type fire extinguishers	33 districts	Thermal imaging cameras	2EA
Air respirators	71EA	Automated external defibrillators (AEDs)	29EA
Fire suits (coats/pants)	55EA	Oxylators (portable)	3EA
Fire helmets	47EA	Autonomous industrial drone	1EA
Multi-purpose stretchers	15EA	Automatic chest compression device	1EA

Air respirators			Fire helmets	Fire suits (coats and pants)	Multi-purpose stretchers	Xenon searchlights
50 minutes		Auxiliary masks				
SET	Reserve					
71	31	14	47	55	15	8

Smoke-penetrating lanterns	Mega-phones (portable)	Electric winches	Thermal image cameras	AEDs	Oxylators (portable)	Automatic chest com-pression device	Oxygen charging unit	Auton-omous industrial drone
10	4	10	2	29	3	1	2	1

Integrated Control Center

Area	Operation	Personnel	Equipment in Operation			
			CCTV	Servers	Monitor	Big band
255㎡	24 hours 365 days	6 People (Emergency Rescue Team, ERT)	382 units	maximum 550 units	24 units	3 units

Hazardous Machinery and Equipment

Classification			Sum
Cranes (rated load)	Overhead, gantry	Less than 10 tons	384
		Less than 50 tons	401
		Less than 100 tons	89
		200 tons or less	79
		500 tons or less	23
		Over 500 tons – 1,000 tons or less	2
		Over 1,000 tons – 1,500 tons or less	2
		Over 1,500 tons – 2,000 tons or less	2
	Subtotal		982
	Towers	Less than 20 tons	59
		30 tons or less	2
	Subtotal		61
	Jibs, others	Less than 10 tons	96
		Less than 50 tons	38
		100 tons or less	15
		Over 100 tons – 200 tons or less	6
		Over 300 tons	1
	Subtotal		156
	Hoists	Less than 5 tons	232
		5 tons or less	142
	Subtotal		374
	Mobile crane		136
Total			1,709
Pressure containers		Less than 2m³	532
		Less than 5m³	202
		less than 30m³	24
Total			758
Press and shearing machine		Less than 50 tons	8
		Less than 200 tons	6
		500 tons or less	1
		Over 500 tons	2
Total			17
Conveyors			107
Gondolas			1,232
Lifts			40
Industrial robots			4
Grand Total			3,867

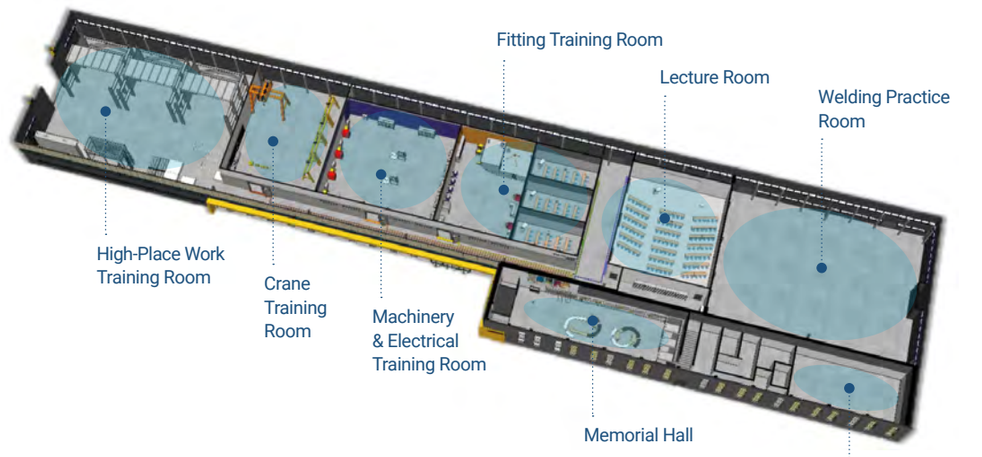
Facilities Subject to PSM

Business Unit	Department	Process/Facility	Material Used	Remarks
Shipbuilding	Pre-Painting Department	Yard 1 Painting Shops (1–8)	Paint/NG	
		Yard 2 Painting Shops (1–6)	Paint/NG	
Offshore	Offshore Painting Department	Offshore Painting Shop (1–2)	Paint/NG	
Engine & Machinery	Engine Commissioning Equipment Operation Department	Yard 1-1 LPG Supply Facility (Fuel Gas Supply)	LPG	
		Yard 1-2 LNG Supply Facility (Fuel Gas Supply)	LNG	
		Yard 1-3 Methanol Storage and Supply Facility	Methanol	
		Yard 1-3 LNG Supply Facility (Fuel Gas Supply)	LNG	
		Yard 2-1 Methanol Storage and Supply Facility	LNG	
		Yard 2-2 LNG Supply Facility (Fuel Gas Supply)	LNG	
		HiMSEN 2 Shop Gas Compressor Facility	LNG	
		HiMSEN 2 Shop Methanol Storage and Supply Facility	Methanol	
		Engine 3 Shop Ammonia Storage and Supply Facility	Ammonia	
Corporate Safety and Health Office	Energy Operation Department	Ethylene Storage	Ethylene	
Management Support	Logistics Support Department	In-house Oil Storage	Gasoline, kerosene, etc.	

Training Facilities

Training Facility (ISTC)

Sitting on a total area of 3,591 ㎡, the Integrated Safety Training Center (ISTC) boasts the largest scale among safety training facilities operated by Korean companies. It consists of a total of 13 training rooms, including 5 lecture rooms, 5 job-specific practical/experiential training rooms, and 3 practical training rooms for equipment qualification certification. It is differentiated from other companies' safety training centers by its ability to provide integrated training ranging from theoretical education to on-site practice and activities in one place.



Training Room	Training Course	Remarks
Scaffolding / High-Place Work Training Room	① Practical/experiential risk assessment training (scaffolding) ② Gondola operation qualification training ③ Scaffolding installation/dismantling qualification training	
Crane Training Room	① Crane signaler qualification training ② Pendant/remote control operator qualification training	
Fitting/Grinding, Painting Training Room	① Practice/experiential risk assessment training (fitting/grinding) ② Practice/experiential risk assessment training(Painting)	
Welding, Piping/Outfitting Training Room	① Practice/experiential risk assessment training (Welding) ② Practice/experiential risk assessment training (Piping/outfitting)	
Lecture Rooms (Large/Medium/Small)	① Periodic supervisor safety training ② Foreign worker safety training ③ In-house qualification training (theory), etc.	
Machinery/Electrical Training Room, Welding Practice Room	Technical training courses led by the Technical Education Institute	

Creation of a Memorial Hall for Safe Workplace

Under firm adherence to the “Safety First” principle, HD HHI continues to strive for the creation of a safe workplace. As part of these efforts, we have established a memorial hall in the lobby of the ISTC to honor and remember those who passed away due to industrial accidents in the past. An outdoor memorial sculpture entitled Memory-Harmony has been set up to commemorate the victims and strengthen the resolve of labor and management to create a safe workplace together.

Training Facilities (Safety Experience Training Center)

The Safety Experience Training Center (SETC) located within the Technical Education Institute contributes to accident prevention by providing essential safety training to newly hired employees. The training programs include activities such as falling while wearing safety harnesses, moving on vertical ladders and scaffolding, working in confined spaces, electrical safety and CPR, and fire response drills. These activities provide employees with hands-on experience and help them internalize the importance of workplace safety rules.

- Location: Technical Education Institute within HD HHI
- Establishment: 2005 / Improvement: 2021
- Size: 1,388 ㎡ / Seating capacity: 90 people

Private SETC Certification

In September 2022, the SETC was officially certified as a Private Safety Experience Training Center by the Korea Occupational Safety and Health Agency (KOSHA). This certification was achieved by passing a rigorous evaluation of the suitability of training courses, personnel, facilities, and activity and practice equipment. Based on this certification, the center can now provide systematic and effective safety training opportunities not only to company employees and subcontractors but also to external partners, other companies, public institutions, and the local community.

Training Facility (VR Training Rooms)

We have set up VR Training Rooms at the ISTC and various sites, allowing workers to vividly experience a wide range of potential on-site situations through virtual reality technology. In keeping with the increased number of our foreign workers, foreign language versions are provided for more effective training.

Training Facility (Lecture Rooms)

In addition to the ISTC and the SETC, the Corporate Safety and Health Office operates a total of five additional lecture rooms: two at the Corporate Safety Department and one each at Shipbuilding, Offshore, and Engine & Machinery Safety Departments. In addition, separate in-house lecture rooms are also operated by each Production Department at key sites.

Corporate Safety Department Lecture Hall

- Location: 4F, Health Promotion Center
- Seating capacity: Maximum 120 people

Corporate Safety Department Small Lecture Room

- Location: 4F, Health Promotion Center
- Seating capacity: 60 people

Shipbuilding Safety Department Lecture Room

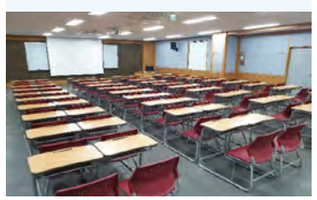
- Location: 2F, Production Technology Center 2
- Seating capacity: Maximum 50 people

Shipbuilding Safety Department Lecture Room

- Location: 8F, Out-shop 1
- Seating capacity: Maximum 80 people

Offshore Safety Department Lecture Room

- Location: 1F, Offshore Technology Center
- Seating capacity: Maximum 120 people



Engine & Machinery Safety Department Lecture Room

- Location: 2F, Main Building, Engine & Machinery Business Unit(Machinery Processing 1-1 Shop Annex)
- Seating capacity: Maximum 40 people

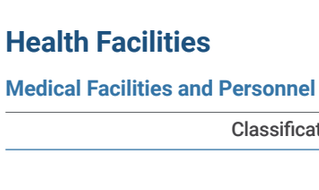
Health Facilities

Medical Facilities and Personnel

Classification		Personnel	Remarks
Health Promotion Center	In-Plant Hospital	3 doctors and 6 nurses	
	Rehabilitation Therapy Center	4 physical therapists, 1 exercise therapist	
Offshore In-Plant Hospital	1F, Offshore Technology Center	1 doctor and 2 nurses	
Offshore Physiotherapy Center		1 physiotherapist	
Local medical offices	Local medical offices (7 locations)	1 nurse at each location (7 total)	
Oriental Medicine Clinic	3F, Culture Building	2 oriental medicine doctors and 2 nurses	
Psychological Counseling Office		3 psychological counselors	Mind Garden

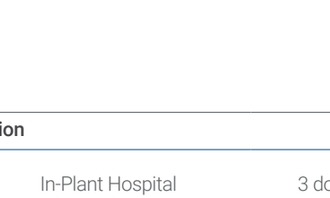
In-Plant Hospital at the Main Shipyard

- Location: 2F, Health Promotion Center
- Medical treatment / Health counseling / First-aid response



Physiotherapy / Rehabilitation Therapy Center at the Main Yard

- Location: 3F, Health Promotion Center
- Physical and rehabilitation therapy



Offshore In-Plant Hospital / Physiotherapy Center

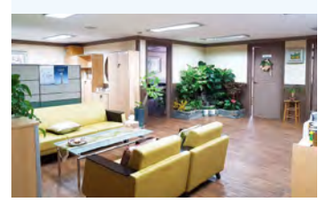
- Location: 1F, Offshore Technology Center
- Medical treatment / Health counseling / First-aid response

Oriental Medicine Clinic

- Location: 3F, Culture Building
- Treatment with acupuncture, moxibustion, cupping, etc.

Psychological Counseling Office

- Location: 3F, Culture Building
- Psychological treatment programs



Local Medical Offices (7 locations)

- Treatment and health counseling

Equipped with automated external defibrillators

- Located in main buildings with a large number of people and external visitors

What Should We Learn from the Aricell Disaster

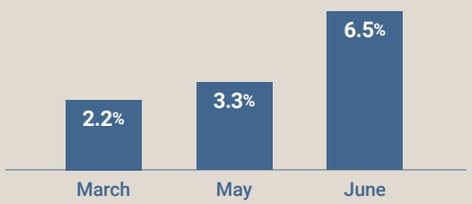
2024.6.24. Fire Disaster in Aricell

On June 24, a catastrophic explosion occurred at the factory run by Aricell, a lithium battery manufacturing company in Hwaseong-si, Gyeonggi-do, resulting in the worst disaster in the history of the Korean manufacturing industry. The investigation into the disaster, which claimed the lives of 23 workers, revealed that the company had employed a large number of unskilled workers from an unqualified worker placement company for the production of lithium batteries without establishing proper safety measures such as emergency exit rules or safety training, which led to the significant casualties. To meet production targets, they newly supplied 53 workers from a worker placement service provider who did not have the proper permits, and assigned them to major processes without sufficient training. It was also found that, as the factory rushed to meet delivery schedules, the defect rate of batteries with case dents, pinholes, and other previously unseen types of defects increased dramatically during the manufacturing process.

While the media coverage of the disaster focused on the fact that a significant number of foreign workers died, we cannot overlook or disregard the fact that it is a microcosm of the chronic and structural problems in corporate safety and health management in Korea. The disaster should not be viewed as a localized and superficial issue as if it were a problem specific to a particular company. Only when we address the problems revealed through the Aricell disaster with the mindset that they could very well occur in our company can we derive many lessons and learning points for prevention.

With a prayer for the repose of the victims who sadly lost their lives in the disaster and in the hope that such a disaster will never happen again, all of us need to get our heads together and work toward a safer working environment.

Battery Defect Rate



Major Timeline of the Accident

May 16	Discovered heating due to micro-short in production batteries for the first time
June 8	Halted heating cell sorting; classified separately stored cells subject to heating as normal cells
June 22	One cell with completed electrolyte injection exploded (the factory kept the production line active without cause analysis or appropriate measures)
June 24	Cells manufactured at the same time as the ones that exploded were moved to Wing 3, 2nd floor, early in the morning (followed by the fire an hour later)

PART. 4

Safety and Health Management Performance

HD HYUNDAI
HEAVY INDUSTRIES

4-1 Safety Management Achievements

Having selected “Safety for All” as one of its four core values, HD HHI has been focusing all its capabilities on safety with labor and management working together. We will continuously reform and change to achieve a workplace where everyone is safe, furthermore, to become a company where safety is its brand.

SAFETY
HEALTH

Safety Management Achievements (2019–2024)

History of HD HHI

HD HHI has been promoting safety as its first management policy since 2016. We continue to strengthen the company's safety through continuous improvement, innovation, and bold investment for the prevention of fatality accidents every year.

HD HHI's "Safety Vision 2027" aims to achieve "a workplace where everyone is safe" and "a company where safety is its brand." This vision consists of safety goals, implementation strategies, and key promotion points for the next five years, which we continue to implement in 2024 by faithfully adhering to our roadmap of short-term and long-term plans.

From June 2023 to September 2024, we successfully completed the first phase of the 4th advancement development project for the Integrated HSE Management Computerized System (Hi-SEs) and built an integrated system based on the concept of a "safety portal" to support our Safety Vision 2027, laying the foundation for enhancing the efficiency and effectiveness of safety and health work.

HD HHI is committed to establishing a safety-first culture and creating a safe workplace without fatality accidents through the participation and cooperation of all members.

2019

Jan. Held a workshop on the safety of shipbuilding & offshore sector
Feb. Examined the level of safety culture
May Held an agreement ceremony for cooperation in safety management among prime contractors and subcontractors
Jun. Specialized consulting on Process Safety Management (PSM)
Jul. Improved the enterprise-wide safety incentive program
Aug. Established and operated the Offshore Management Center
Oct. Held an enterprise-wide safety forum
Dec. Conducted a program for training in-house examiners on the safety culture of affiliates

2020

Apr. Conducted enterprise-wide activities for safety improvement (Hi-SAFE)
Jun. Established comprehensive countermeasures for improving safety management
- Held a ceremony to proclaim a new safety culture
- Reorganized to a safety-oriented business unit system (established the Safety Production Division / Responsible Safety Management System)
- Established Safety Risk Management (SRM) team and Standards Innovation TF
- Granted the "Securing Safety Authority (SSA)"

Aug. Conducted an enterprise-wide safety risk contest

2021

Apr. Established a triple risk management system for high risks (Supervisor – Safe Clover – Safety supervisor)
May. Conducted practice/experiential training programs for high risk work
Jun. Established comprehensive safety countermeasures to prevent fatality accidents
Jul. Conducted an enterprise-wide mock drill in preparation for typhoons
Sep. Examined the level of safety culture
Oct. Established a risk assessment system (Hi-STANDARD)
Dec. Opened a platform for proposing ideas for safety improvement

2022

Mar. Launched the Corporate Safety and Health Office (the president-level CSO appointed)
Established and operated a safety compliance system (the Safety Management Committee and the Safety-Production Deliberation Committee)
Apr. Enterprise-wide safety risk contest / 3 major safety facilities (scaffolding, lighting, ventilation) TF operation
Jul. On-site safety management activities by all officers and department heads
Operated a mobile safety work order system
Sep. Conducted a safety short-form contest
Conducted a safety mascot-naming contest
Oct. Promoted the use of SSA and rewarded best practices
Nov. Signed technical support agreements with external subcontractors for safety management
Dec. Established the Safety Inspection Section

2023

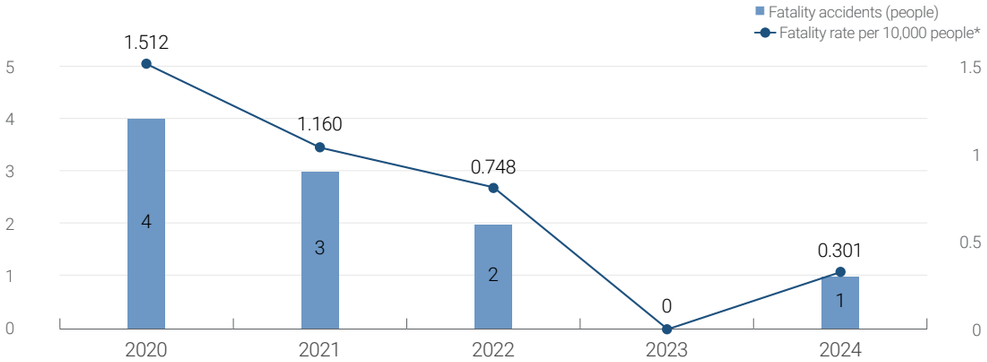
Jan. Held workplace safety wishing event
Feb. Developed and implemented integrated safety culture diagnosis program, reestablished risk assessment system, and conducted enterprise-wide special safety management activities
Mar. Launched hotline for Securing Safety Authority (SSA)
Apr. Declared Safety Vision 2027
Jun. Revised enterprise-wide Emergency Crisis Management Manual, conducted "My Commitment to Safety" contest, and changed the safety outfits for managers and supervisors
Jul. Integrated management of work plans and instructions
Oct. Conducted enterprise-wide special safety management activities
Dec. Revised the procedure on the work standards and risk assessment management, conducted special year-end safety management activities

2024

Jan. Held workplace safety wishing event
Feb. Conducted special safety training to eradicate major accidents
Conducted February Special Safety Management Activities
Apr. Engaged in April Special Safety Activities
May Conducted 2024 Safety Culture Level Diagnosis (survey)
Jun. Engaged in June Special Safety Activities (crane operation)
Held an enterprise-wide safety risk contest
Held a Crane Safety Accident Prevention Task Force meeting
Held a safety strategy workshop for 2024 1H
Jul. Launched an enterprise-wide permit to work (PTW) program for hazardous works
Aug. Launched the HD Safe Pay program
Sep. Completed the 4th Hi-SEs advancement project (Web, App)
Oct. Engaged in the October Enterprise-wide Special Safety Activities
Nov. Began implementation of the Special Crane Safety Rules
Dec. Holding a Hi-SAFE project contest
Held a safety strategy workshop for 2024 2H

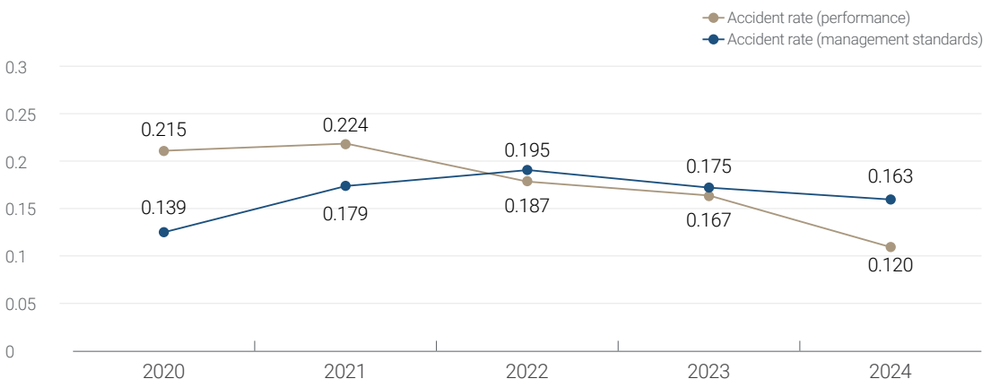
Safety Management Achievements in 2024

Fatality Accidents and Fatality Rate per 10,000 people



* Fatality rate per 10,000 people : Deaths caused by industrial accidents per 10,000 workers

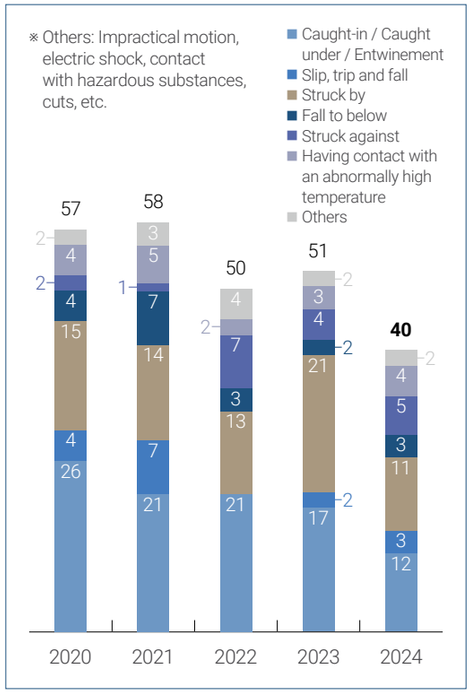
Accident Rate Management Standards and Performance



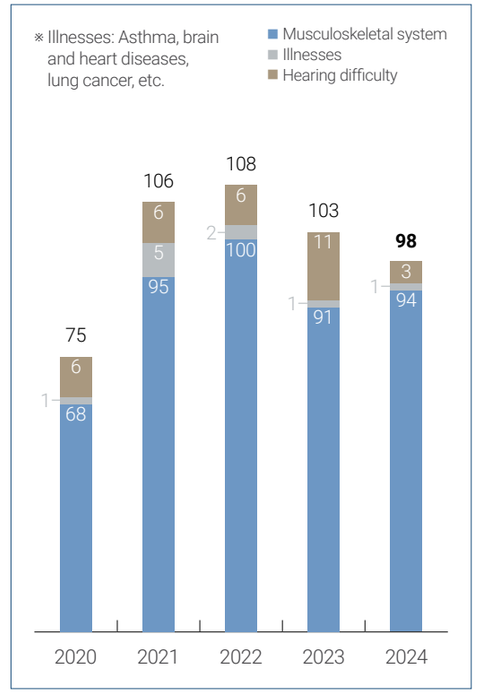
2024 Industrial Accidents by Business Unit

	Shipbuilding	Offshore & Energy	Naval & Special Ship	Engine & Machinery	Management Support / Safety / Asset	Total
Accidents (cases)	31	1	2	3	3	**40**
Average no. of people	23,738	2,901	1,866	3,124	1,599	**33,228**
Accident rate	0.131	0.034	0.107	0.096	0.188	**0.120**
Fatality rate per 10,000 people	0	3.447	0	0	0	**0.301**

Accidents by Type



Work-Related Disease and Illness
(based on workers' compensation approval for current employees)



4-2 Management Performance of the Safety Planning Section

The Safety Planning Section manages the establishment of a safety system for all organizations across the company through the development of safety policies and system planning.
It also establishes autonomous safety management systems, supports smooth operations, and encourages business units and departments to set safety goals and implement safety improvement activities under the safety and health management system.

SAFETY
HEALTH

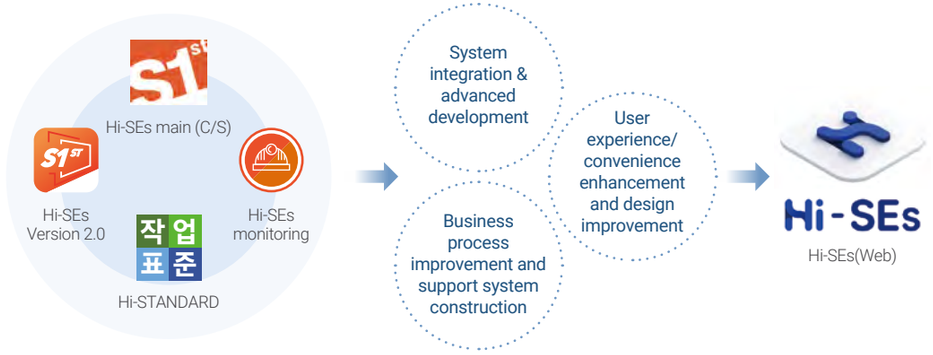
Major Achievements of the Safety Planning Section in 2024

Detailed Action Plan	Implementation Methods	Major Achievements
Promoting site risk assessments	**Strengthening risk assessments operability**	
	(Periodic) Risk assessments	Completed 2024 1H/2H Periodic Risk Assessments (completed 100% 2024 1H assessments for enterprise-wide subcontractors)
	Establishing a methodology for evaluating the risk assessment	Held Risk Assessment Committee meetings and reviewed key assessment items
	Refining the system for selecting targets for ad-hoc risk assessment	
	Developing logic for selecting targets for ad-hoc risk assessment (guide tools, etc.)	Completed the development of the ad-hoc risk assessment target selection logic Computerized the Hi-SEs System (non-routine work)
	Promoting horizontal deployment of accidents and established ad-hoc risk assessment monitoring system	Completed the development of the monitoring system for ad-hoc risk assessments
Advancing the triple safety management system for high risk works	**Establishing a production-led, high risk work management process**	
	Improving high risk work management system: Unification of PTW / fatality accident prevention measures, coordination of production and safety authority	• Organized existing high risk works organized into "acts" by discipline/ sector and completed the registration of works requiring PTWs (including a checklist) • Completed the development of a dual management system with PTW-requiring works and department-managed works
Improving the reward/ punishment system	**Establishing a reasonable and effective reward system**	
	Establishing enterprise-wide safety mileage system / improving enterprise-wide rewards	Completed the development of HD Safe Pay and the computerization of Hi-SEs and achieved 75% enterprise-wide HD Safe Pay usage rate (projected up to 80% participation; target achieved)
	Revising disciplinary standards for violators of safety golden rules	Made and distributed Work Stop stickers
Complying with the Serious Accidents Punishment Act	**Advancing the performance evaluation system related to the Serious Accidents Punishment Act**	
	Reviewing the Serious Accidents Punishment Act and integrating/ standardizing internal review/evaluation and implementation review in connection with the Act and ISO 45001	Currently planning a system diagnosis
Enhancing the usability of the integrated HSE management computerized system	**Developing the fourth upgrade of the integrated HSE management computerized system (Hi-SEs)**	
	Hi-SEs (C/S, Web, Monitoring), Hi-Standard system integration (Phase 1 → Phase 2 development)	Completed Phase 1 advancement
	Revisiting foundational data items for SLI operations and calculations	Added and reorganized SLI items
Operations/ General	**Corporate Safety and Health Office Operations/General**	
	Committee operation: Safety Management Committee (semiannual), Safety Innovation Advisory Committee (general meeting once a year, quarterly)	Held two Safety Management Committee meetings and a Safety Innovation Advisory Committee meeting
	Enterprise-wide management meeting (once a week), safety management meeting (once a month), safety council of the three shipbuilders	Prepared enterprise-wide management meeting documents and held weekly meetings Implemented the workshop/consultative meeting plans
	Publishing the 2024 Safety and Health Management Plan report	Published the 2024 Safety and Health Management Plan report in Korean/English versions
	Safety uniforms for safety managers/supervisors	
	ISO 45001 certification audit	Completed the ISO45001 certification audit
	Creating the 2025 business plan	Compiled the annual performance data and established the 2025 plans

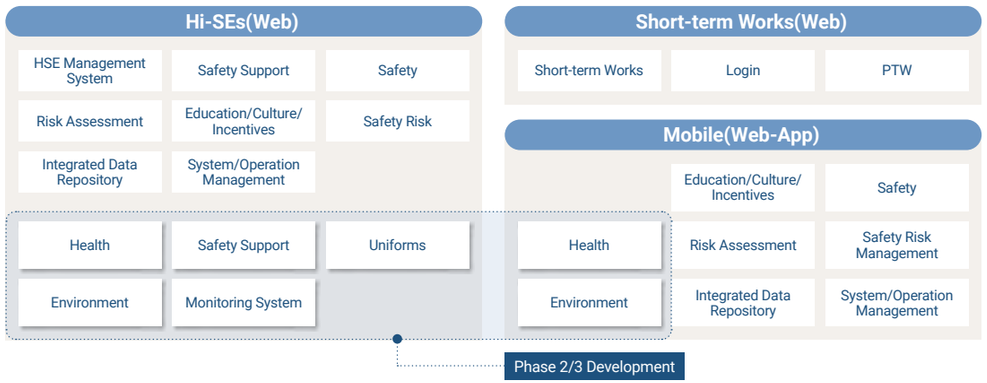
Usability Enhancement of the Integrated HSE Management Computerized System

Development of the Fourth Advancement of the Integrated HSE Management Computerized System (Hi-SEs)

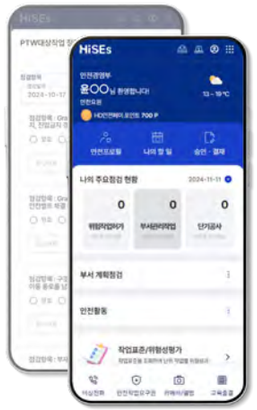
Our computerized safety and health management system has newly evolved from the previous Client/Server (C/S) based programs, which could be somewhat rigid, to an intuitive and sophisticated Web-based system through Phase 1 of our 4th advancement project. The main features of this advanced system include the integration of previously dispersed systems and the reorganization of menu structures to dramatically improve user convenience. In addition, the high-place work management and inspection process has been computerized based on risk assessment and PTW data, and the user experience of the mobile app has been greatly improved for more efficient and convenient access.



Project Development Scope



Hi-SEs Web Version Main Menu Image

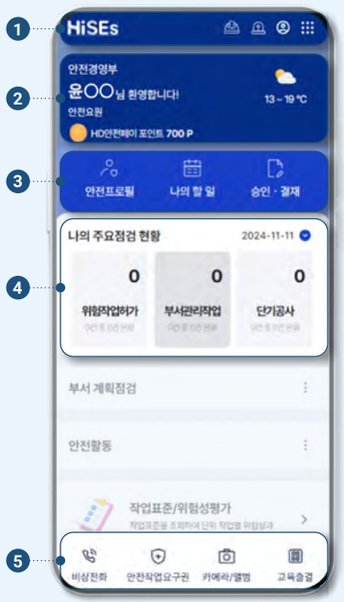


Hi-SEs Mobile App Image

"Safety Assistant" in My Hand, Launched in 2024!

The Hi-SEs mobile app is designed to allow users to immediately access necessary information and perform simple input tasks in the field without a trip back to the office. While it has been used mainly by safety organizations, the newly improved app has been developed for all employees to help them perform their safety tasks more efficiently. The app serves as a "safety assistant in your hand," providing easy access to and utilization of various information such as safety, health, environment, education, incentives, and data repository, enabling more practical and effective task performance in the field.

In particular, the main screen of the mobile app is designed with personalized information that employees need for site safety management, allowing important matters to be identified at a glance. For key personnel performing triple safety checks on high risk work, such as supervisors, Safe Clover, and safety supervisors, the app improves work efficiency by providing an intuitive overview of high risk work inspection targets and status. Additionally, the existing training attendance function has been integrated for quicker access through the Hi-SEs mobile app, and camera and album functions will also be continuously improved for user convenience.



① Fixed Top Menu
② Weather, Safety Point Information
③ Convenience Functions
④ Personalized Information
⑤ Fixed Bottom Menu

Implementation of Systematic High Risk Work Management

Completion of High Risk Work Management

Integrated Management of High Risk Work

Under the leadership of the Shipbuilding Business Unit, the enterprise-wide high risk work management system has been reorganized to address the inefficiencies caused by the overlaps between the PTW program, which is one of our main site risk management systems, and the department-level inspection and management systems for high risk works.

High Risk Work Management Begins with "Risk Assessment"

High risk works are selected based on risk assessment results and organized into "acts" to be managed within the PTW system. Department-specific high risk works not included in the PTW are designated as "department-managed work" to be autonomously managed by each production department.

Selection and Focus Management

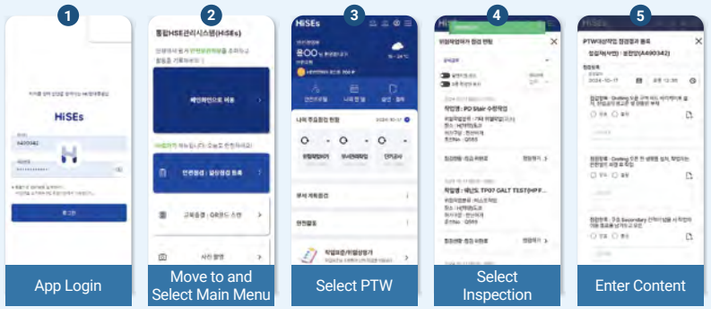
Through these efforts, the company has established a high risk work management system connecting "department-managed works" with "PTW-requiring works," and classified PTW works according to risk levels into works requiring electronic permits, safety face-to-face permits, and safety on-site permits. In particular, works requiring safety face-to-face permits and safety on-site permits are subject to intensive inspection through a triple safety management system consisting of production department supervisors, Safe Clover, and safety supervisors. This enables efficient and precise safety management through "selection and focus."

Our Site Risk Management System

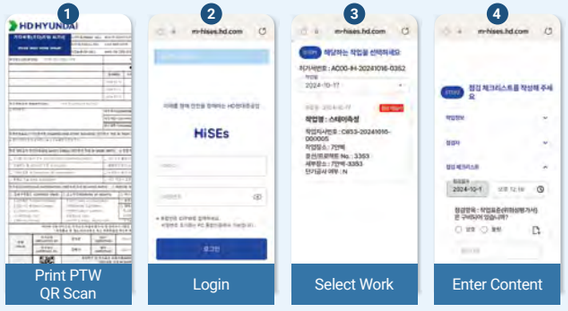
High Risk Work Inspection Method

High Risk work inspection can be easily completed by scanning the QR code on the Hi-SEs mobile app or printed PTW. When entering PTW information during mobile safety work order issuance, the work is automatically included as a high risk work inspection target, and the inspection target and status are accessible in real-time through the Hi-SEs mobile app. Supervisors, Safe Clover, and safety supervisors can receive navigation-like guidance on where to inspect during high risk work inspection, and after arriving at the site, they can perform the actual inspection by scanning the QR code on the permit (PTW) and recording the inspection results.

Using the App for Inspection



Scanning PTW QR Code



Achieving Self-Regulated Safety Management Led by the Production Departments

With the transfer of the authority to grant PTW electronic approval from the safety organization to the production organization, the production organization can now independently perform risk work planning and approval procedures. This represents the first case of applying the concept of production-led responsible safety management to the computer system to ensure strict compliance with safety standards and principles by having the producer directly approve hazardous work. The safety department plays a role in supporting and monitoring this, establishing an important turning point in strengthening the safety management system.

While the electronic approval authority has been transferred to the production organization, for high risks work requiring safety face-to-face permits and safety on-site permits, work can only begin after explaining the safety measure plan for the hazardous work to the safety supervisors face-to-face, completing the reporting procedure, and obtaining a handwritten signature after electronic approval.

Activation of the Risk Assessment System

Strengthening of Risk Assessments Operability

Hi-STANDARD System Advancement

HD HHI strengthened its Integrated HSE management computerized system (Hi-SEs) and its mutual feedback and monitoring functions by linking systems, based on the expanded and systematized concept of “periodic/ad-hoc/on-site.” The ad-hoc risk assessment and risk assessment committee operation status, which were previously managed manually, have been systematized with improved linkage functions, which is expected to result in more effective and efficient risk assessment.

Risk Assessment Dashboard

Ongoing Operation of the PDCA-Based Risk Assessment System

Periodic risk assessments were performed in the first and second halves of 2024, with ad-hoc risk assessments for responding to safety accidents and changes in processes and construction methods. As a result, the establishment and revision of all 23,845 work standards were completed, and 23,845 risk assessments were completed. In particular, as a result of the risk assessments, special reduction measures were registered for 7,990 important risk factors classified as "critical" with a score of 8 or higher, and risk reduction activities are being implemented according to the "plan-do-check-act" (PDCA) process.

Risk Assessment Results in 2024

Categories	Description
Assessment period	March-May (1H assessment), September-November (2H assessment), ad-hoc assessment at other times
Assessment organization	Production / production support departments and in-house subcontractors
Assessment results	[Direct Employees] 11,544 Work Standards / 11,544 Risk Assessments completed [Subcontractors] 12,301 Work Standards / 12,301 Risk Assessments completed

Hi-STANDARD Registration (Direct Employees)

Business Unit	Work Standards	Risk Assessment
Shipbuilding	4,115 cases	4,115 cases
Offshore & Energy	969 cases	969 cases
Naval & Special Ship	4,918 cases	4,918 cases
Engine & Machinery	732 cases	732 cases
Management	36 cases	36 cases
Safety/Asset	773 cases	773 cases
Others	1 case	1 case
Total	11,544 cases	11,544 cases

Operation of Risk Assessment Committee in Each Department

For a thorough review of the risk assessment results to find missing risk factors and substantively assess risks, we operate department-level risk assessment committees. The committees, which are comprised of steering members and executive members (both from labor and management), review the departmental risk assessment results during the periodic risk assessment period and implement improvement measures for deficient areas or areas requiring improvement. Through these activities, labor and management work together to promote effective risk assessment by reflecting detailed site risk factors. In 2025, we plan to further activate the risk assessment committee activities and improve their effectiveness through various methods, such as providing incentives.

Detailed Implementation of the Ad-hoc Risk Assessment Target Selection System

Improvement of the Ad-hoc Risk Assessment System

The work standard and risk assessment management procedures were revised to specify the targets for ad-hoc risk assessment by applying the Management of Change (MOC) checklist method and to determine the assessment method through a 3-level risk level judgment method. Additionally, the existing manual management method was improved to computerize ad-hoc risk assessment, allowing employees to complete records and management of non-routine work through the computer system.

Management of Change (MOC) Checklist Method

Change Factors	Judgment Criteria	Check
Technical Changes	• Introduction or change of works or work procedures • Research and development, including new ship type development, design drawing revision, and change of purchase items	☐
Equipment Change	• Introduction or change of new machinery/tools/equipment/ raw materials • Maintenance or repair of machinery/tools/equipment	☐
Organizational Change	• Work performed by organizations unfamiliar with our sites, such as those employed for short-term works and construction work	☐
Environmental Change	• Intensive work (no work standard) • Works with changed work location (no work standard)	☐
Accident Occurrence	• Works where a major industrial accident or industrial accident has occurred	☐

Risk Level 3-Stage Judgment Method

Risk Level	Judgment Criteria	Check
Very High	• Risks potentially resulting in fatality or disability in case of an accident	☐
Medium	• Risks potentially resulting in injuries requiring treatment for more than 3 days or risks potentially requiring the victim's absence from work in case of an accident • In case of near-miss incidents	☐
Very Low	• Risks potentially resulting in an injury or illness that does not affect work performance or less than 3 days of absence	☐

Ad-hoc Risk Assessment Method

Risk Level	Ad-hoc Risk Assessment Method	Agenda
Very High	Table Meeting(Including safety organization)	Risk assessments conducted by work-related organizations and safety departments
Medium	Table Meeting (performed internally by the work department)	Risk assessments conducted by work-related organizations or internally by work department
Very Low	Standing Meeting (performed internally by the work department)	Risk assessments conducted internally by the work department

Improvement of an Enterprise-wide Safety Incentive Program

Improvement for a More Reasonable and Effective Reward and Punishment System

The Corporate Safety and Health Office encourages active participation in safety activities through the safety reward system. By providing appropriate incentives to organizations and individuals with outstanding safety performance, we are building a "safety first culture" together.

However, we realized that the impact of quarterly, semi-annual, and annual incentives on individual awareness has been less than ideal. As such, we considered how to improve the organization-centered incentive system in terms of individual responsibility and motivation, and have introduced a safety point system called the "HD Safe Pay" for more efficient operation of the enterprise-wide safety reward system.

Categories	Incentive Title	Description	Cycle	Required Budget
Safety Rewards for Organizations	Core Value Practice Reward	Outstanding HD HHI organizations reflecting group core values in comprehensive safety performance	Half-yearly	KRW 58 million
	Subcontractors with Outstanding Safety Performance	Outstanding subcontractors selected through evaluation of comprehensive indicators for self-regulated safety management	Quarterly	KRW 160 million
	Hi-SAFE	Organizations with outstanding performance in safety improvement tasks	Yearly	KRW 48 million
Safety Rewards for Individuals	HD Safe Pay	A point system for safety performance for all employees participating in safety activities	Constant	KRW 1,480 million
	Accident Prevention Contributor Award	Incentives to employees who contributed to the prevention of fatality accidents	Constant	KRW 2 million
	Outstanding Safety Supervisors	Incentives for excellent individual performance based on safety supervisor job performance evaluation results	Half-yearly	KRW 9 million
	Outstanding Subcontractor Safety Managers	Incentives for outstanding individual performance based on subcontractor safety manager evaluation results	Quarterly	KRW 9 million

Introduction of "HD Safe Pay"

The Corporate Safety and Health Office has introduced the "HD Safe Pay" system to transform the enterprise-wide safety incentive system.

By providing points for individual safety and health activities, this system encourages autonomous safety management and strengthens workplace safety by expanding investment in raising workers' safety awareness.

HD Safe Pay aims to foster a safety culture with universal participation. By establishing an activity and process-centered safety incentive system, it motivates employees to voluntarily participate in safety activities, contributing to a culture of praise, encouragement, and mutual respect.

Distinctive Features of "HD Safe Pay"

HD Safe Pay is an incentive system designed to move away from traditional organization-centered incentive structures, allowing all employees to receive real-time compensation based on individual safety performance.

To implement HD Safe Pay, we improved the HiSEs system and significantly enhanced user convenience by revamping the mobile platform.

In addition, thanks to our collaboration with Kakao Pay, a comprehensive fintech service provider, employees can now convert earned points to KakaoPay points on a point-for-point basis and use them like cash at various online and offline affiliated stores.

Point Accrual Standards by Content

Contents	Description	Point Distribution
Safety Work Orders	Points earned when checking work orders via mobile	Up to Monthly 1,000p; 50p per person/day
On-site Risk Assessment	Workers: Points earned by conducting on-site risk assessments via mobile Managers: 10% earned when completing worker assessments	Up to monthly 2,000p; 100p per person/day
Safety Reports	Points earned by filing safety reports to build safe work environments	Up to monthly 1,000p for accumulating points on up to 2 reports
Safety Inspections	Points earned based on safety inspection status	Up to monthly 1,000p for a month with 10+ safety interventions
Safety Education	Points earned by watching mobile safety training contents	Up to monthly 1,000p; point awards vary by content
Safety Commendation Coupons	Safety Commendation Coupons issued via mobile/PC	2,000p per a praise coupon

Core Value Practice Award

As an incentive system for internalizing group core values, awards are presented to departments with outstanding safety performance under the core value of "Safety for All." Based on review scores and organizational size, rewards range from a minimum of KRW 1 million to a maximum of KRW 12 million.

Classification	Shipbuilding	Offshore & Energy	Naval & Special Ship	Engine & Machinery
1H	4 departments	2 departments	2 departments	2 departments
	KRW 17 million	KRW 2 million	KRW 2 million	KRW 9 million
2H	4 departments	1 department	2 departments	2 departments
	KRW 15 million	KRW 1 million	KRW 2 million	KRW 10 million

Subcontractors with Outstanding Safety Performance

Subcontractors are assessed on a quarterly basis for safety leadership, accident indicators, safety management systems, and on-site safety management. Outstanding subcontractors receive KRW 10 million in incentives.

Classification	Shipbuilding	Offshore & Energy	Naval & Special Ship	Engine & Machinery
Q4	5 companies	1 company	1 company	1 company
	KRW 50 million	KRW 10 million	KRW 10 million	KRW 10 million
Q1	5 companies	-	-	1 company
	KRW 50 million	-	-	KRW 10 million
Q2	5 companies	1 company	1 company	1 company
	KRW 50 million	KRW 10 million	KRW 10 million	KRW 10 million
Q3	6 companies	-	-	1 company
	KRW 60 million	-	-	KRW 10 million

Hi-SAFE

Hi-SAFE is an enterprise-wide safety improvement activity implemented for design, production, and production support departments, with incentives given through presentations of outstanding projects.

Category	Business Unit	Department	Project Name	Prize
Grand prize	Offshore & Energy	Offshore Structure Design Department, Construction Department 5	Applied construction methods to secure work safety during installation of UCF and Topside modules	KRW 10 million
Top prize	Shipbuilding	Production Support Department 1	Improved and standardized shipboard emergency escape facilities	KRW 7 million
	Engine & Machinery	Engine Development Department	Completed the safety design of HiMSEN ammonia engine system	KRW 7 million
Excellence prize	Shipbuilding	Commissioning Department	Developed visually distinguishable methanol (world's first)	KRW 5 million
	Offshore & Energy	Offshore Construction Department 1	Adopted 3D scanning and developed a management system for offshore projects	KRW 5 million
Participation prize	Shipbuilding	Electrical Device Design Department / Machinery Outfitting Department	Standardized propulsion shaft system loading and installation methods	KRW 3 million
	Naval & Special Ship	Naval & Special Ship Outfitting Production Department 1	Applied and improved multi-core pulling equipment	KRW 3 million
	Engine & Machinery	Large Engine Commissioning Department 2	Improved the safety methanol engines for safer operation	KRW 3 million

Accident Prevention Contributor Award

We recognize employees who have minimized accident damage through rapid initial response to fires or personal accidents, or those who contributed to accident prevention by discovering and addressing workplace risk factors with incentives from the Chief Safety Officer, which include both certificates and cash rewards.

Major Awards in 2024
• Shipbuilding Business Unit, 1 person In May 2024, during on-site risk assessment before work at the S3 shelter in the Block Assembly 1 Shop, this employee discovered a ground subsidence under one block support, reported it, and had the work stopped and controlled, contributing to the prevention of a major accident.
• Shipbuilding Business Unit, 2 people In July 2024, they discovered a worker who had collapsed with chest pain and, after realizing that the worker was not breathing, performed CPR, contributing to the prevention of casualties.

Outstanding Safety Supervisor Award

Incentives are presented to safety supervisors who strive for self-development and achieve excellent results in site safety management.

Classification	1H				2H				
Target	Shipbuilding	Offshore & Energy	Engine & Machinery	Naval & Special Ship	Shipbuilding	Offshore & Energy	Engine & Machinery	Naval & Special Ship	Safety Supporting Section
	5	1	1	1	5	1	1	1	1
Prize Money	KRW 4 million				KRW 4.5 million				
Remarks	8 people selected in 1H, 9 people in 2H (KRW 500,000/person)								

Outstanding Subcontractor Safety Manager

We presented incentives to subcontractor safety managers with excellent safety capabilities and outstanding site safety management activities.

Classification	1H				2H			
Target	Shipbuilding	Offshore & Energy	Engine & Machinery	Naval & Special Ship	Shipbuilding	Offshore & Energy	Engine & Machinery	Naval & Special Ship
	5	1	1	1	5	1	1	1
Prize Money	KRW 4 million				KRW 4 million			
Remarks	8 people selected in each half of the year (KRW 500,000 per person)							

Compliance with the Serious Accidents Punishment Act

Examination of Responsible Management Personnel's Obligation to Ensure Safety and Health

To check the implementation of the responsible management personnel's obligation to ensure safety and health as required by the Serious Accidents Punishment Act, internal inspection criteria reflecting the requirements of laws and the Ministry of Employment and Labor (MOEL) guidelines have been established. Following these criteria, the implementation of 15 legally required items is checked every six months, and items requiring improvement are classified as "insufficient" or "partially insufficient" with improvement measures and completion deadlines set and reported to the responsible management personnel.

Responsible Management Personnel's Safety and Health Obligation Compliance Inspection Content

Classification	Activity	Inspection Content
Establishing safety and health objectives and policies	Enterprise-wide safety and health objectives and policies	• Establishment of enterprise-wide safety and health management policy and objectives • Performance against goals (such as the achievement level by major task)
Forming an organization exclusively responsible for the overall control and management of safety and health affairs	Operation of the Corporate Safety and Health Office	• Organization chart of the Corporate Safety and Health Office, personnel status, job assignment table
Identifying risk factors and monitoring for improvement	Work standards and risk assessment (Hi-STANDARD)	• Key contents of the work standard and risk assessment management procedures • Risk assessment results - Results of periodic risk assessments - Results of ad-hoc risk assessment upon the occurrence of accidents - Results of ad-hoc risk assessment for non-routine work/changes in work methods - On-site risk assessment results
	High risk work inspection	• Results of high risk worksite inspection - Results of inspection on implemented measures for fatality accident prevention - Results of supervisors' daily inspections
	Hi-SAFE	• Results of the enterprise-wide safety improvement activities by department
	Safety-Production Deliberation Committee	• Results of the Safety-Production Deliberation Committee operations
	Chemical Management	• Chemical identification and hazard assessment results • Chemical risk assessment results
Allocation and execution of budget necessary for accident prevention	Operation of the safety and health management budget	• Safety and health expense items - Labor, operating, major items per facility investment • Planned and actual safety and health expenses by item
Taking measures to enable safety and health officers and supervisors to perform respective duties	Safety and health officer assessment	• Safety and health officer assessment criteria and assessment results
	Supervisor assessment	• Supervisor assessment criteria and assessment results
Assigning statutory safety officers	Statutory assignment of safety and health personnel	• Assignment of statutory officers, such as safety and health managers, and their completion of training
Collection of opinions from employees on safety and health and improvement measures	Occupational Safety and Health Committee	• Operating standards for the Occupational Safety and Health Committee • Agreements and measures taken by the Occupational Safety and Health Committee
	Subcontractor Safety and Health Committee	• Status of collecting and addressing safety and health opinions from subcontractors
	Enterprise-wide safety risk contest	• Opinions gathered and measures are taken
Preparing a manual for taking measures against major industrial accidents or imminent risks	Manual for emergency and crisis management	• Manuals for emergency and crisis management and emergency planning and response by business units • Results of emergency planning and response by the organization
Establishing standards and procedures if any work is contracted, outsourced, or entrusted	Operation of the Subcontractor Selection Committee	• Results of subcontractor selection deliberation/redeliberation • Results of subcontractors' management assessment
	Assessment of subcontractors' safety and health level	• Criteria and results of the assessment of subcontractors' safety and health level
	Criteria concerning the adequacy of the shipbuilding period	• Criteria concerning the shipbuilding period to secure safety and health when a subcontractor is contracted

Operation of the Safety Management Committee

The Safety Management Committee holds semiannual meetings to report and review the results of the responsible management personnel's safety and health obligation inspection under the Serious Accidents Punishment Act, and to establish the direction of enterprise-wide safety and health policies based on these results.

- Chairperson: CEO
- Committee members: Business unit representatives/heads, Chief Financial Officer, Legal Team leader, Safety Division head, and external members (professors, DNV Division head, etc.)
- Roles: ① Inspection/confirmation of major safety activities under related laws and regulations
  ② Deliberation of major agenda items related to safety and health systems at establishments; deducing improvement plans

Maintenance and Operation of the Safety and Health Management System and the Safety Committee

Tasks for Sustainable Safety Management

HD HHI has established and operates a safety, health, and environmental management system based on international standards and is thoroughly committed to accident prevention through legal compliance and risk management. Additionally, the company continuously strengthens its competitiveness based on trust with stakeholders. Furthermore, to raise the safety management level of the three major shipbuilders through the active exchange of major safety management activities among the companies and to realize integrated response at the group level through rapid decision-making on major internal and external issues and common concerns related to safety and health, a safety cooperation body for the three major shipbuilding companies is being operated.

Safety and Health Management Plans Reported to the BOD

In accordance with Article 14 of the Occupational Safety and Health Act, HD HHI reports and receives approval from the Board of Directors (BOD) on the status of safety and health plans, budgets, facilities, personnel, etc.

Maintenance of Safety and Health Management System Certification (ISO 45001)

We conduct periodic training for HSE personnel in each department on a yearly basis, with internal audits held by in-house auditors to review whether departmental risk assessments and safety and health activities are being properly implemented, followed by third-party certification body audits.

- Certification Body: DNV
- Certification Period: July 2023 - May 2025
- Certification Details: Safety and Health (ISO 45001) 2nd Surveillance Audit / Environment (ISO 14001) Renewal Audit

Classification	Key Recommendations
ISO 45001	• Given the high frequency of work-related and similar accidents and minor incidents, improvement needed to reflect the causes and countermeasures in risk assessments • Strengthen management to ensure triple safety management checks are conducted in a timely manner (before work)
ISO 14001	• Conduct comprehensive risk and opportunity assessments clearly reflecting major issues and environmental regulations • Develop and implement training plans for pollution prevention in departments that may cause marine pollution


DNV
MANAGEMENT SYSTEM CERTIFICATE
HD Hyundai Heavy Industries Co., Ltd.
ISO 45001:2018

Safety Consultative Body for the Three Major Shipbuilders

The three major shipbuilders operate a safety consultative body to raise the level of safety management through the active exchange of safety management activities among these shipbuilders and to respond collectively at the group level through decision-making on major internal and external issues and common concerns related to safety and health.

Classification	Organization	Meeting Cycle	Main Discussion Topics
Strategic Consultation	CSOs / safety officers of the 3 major shipbuilders	Quarterly	• Standardization of safety and health budget criteria • Enhancement of safety culture diagnosis • Status of operation standards for foreign worker equipment qualifications • Measures to reinforce the implementation of the Serious Accident Punishment Act for in-house subcontractors
Working-level Consultation	General managers / managers of the 3 major shipbuilders	Monthly	• Reestablishment of confined space standards • Status of PTW system operation • Sharing of implementation status of mandatory reporting under the Serious Accidents Punishment Act, etc.

Establishment of the Safety Innovation Advisory Committee

HD HHI has established the Safety Innovation Advisory Committee to review the effectiveness and operability of safety sector initiatives and to obtain objective guidance and advice from advisory committee members.

Classification	Description
Committee Organization	• Committee Members (Advisory): KEF's Safety and Health Director, DNV Division Head, Professor at Seoul National University of Science and Technology, Professor at Korea University, Professor at Chung-Ang University • Committee Members (Company): Safety Division Head, Safety Executive Officer, Corporate Safety Department Head, Corporate Safety and Health Support Department Head
Cycle	Half-yearly
Agenda	• Sharing of major government safety and health policies and trends • Presentation of safety vision and safety management direction • Suggestions on safety management direction, etc.

4-3 Management Performance of the Safety Culture Section

The Safety Culture Section establishes a safety-first culture by conducting safety culture level diagnosis, activating programs based on the Safety Career Path (SCP) system, developing safety content, and more. Systematic safety education and diverse educational content are provided to all employees to improve safety culture levels and achieve zero fatality accidents.

SAFETY
HEALTH

Major Achievements of the Safety Culture Section in 2024

Detailed Action Plan	Implementation Methods	Major Achievements
Completing the development of the Integrated Safety Culture Diagnosis Program	**Safety awareness surveys and interviews**	
	Constructing survey/interview program within Hi-SEs	Program construction within Hi-SEs completed
	Conducting annually	Safety awareness survey and interviews completed
	Assessing competencies	
	Linked to safety education courses	Conducting pilot test during ISTC safety training since October
Developing customized safety education programs	**Career path redesign**	
	Redesigning the programs for customized training by tier/affiliation/discipline (including foreigners)	SCP Season 2 planned and in operation
	Revising in-house qualification training	
	Revising training programs for license acquisition	Secured and expanded the instructor pool, and currently implementing computerized Hi-SEs procedures
	Refresher training system improvement and operation	Launched integrated refresher training (July 2024~)
	Training a pool of safety instructors	
	Matching and managing dedicated instructors for each course	Utilized center instructor and in-house certification training instructor pools to assign specialized instructors to each subject
	Developing safety professionals	
	Offering university-linked classes in basic and safety engineering	Completed the basic engineering programs (mechanical/electrical/chemical)
Developing and leveraged effective safety content	**Setting up safety notices**	
	Setting up posts with new designs in the required zones	Completed safety signage installation (Safety Golden Rules, famous safety quotes, etc.)
	Creating safety short-form videos	
	Producing short form videos for different disciplines/subjects	producing 3+ videos monthly for different subjects/categories
	Continuously providing VR training	
	Continuing the operations of VR safety training	Continued VR training (at scheduled safety and health training hours)
	Increasing the use of safety characters	
	Diversifying the types and applications of safety character merchandises	Used HIRO to produce various contents (HIRO costumes, characters, etc.)

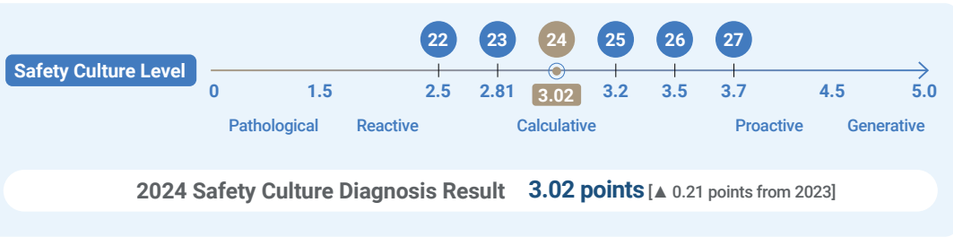
Safety Culture Diagnosis

Safety Awareness Surveys and Interviews

Accurate Safety Diagnosis and Prescription, Safety Culture Diagnosis

Safety culture is measured by the degree to which all members of an organization consider their own and their colleagues' safety as the highest value. A high level of safety culture includes actively engaging in related conversations to increase interest in safety, continuously striving to learn and practice safety, and improving behavior by taking lessons from mistakes.

HD HHI conducted a safety awareness survey in March to measure safety culture levels and conducted interviews from June to July. A total of 20,707 people, including subcontractors, responded to the survey, and 307 employees participated in the interviews.



In the 2024 Safety Culture Diagnosis, our safety culture level was rated at 3.02, near the lower end of the third level, “Planned Level.” This marks a steady improvement from scores of 2.48 in 2022 and 2.81 in 2023, demonstrating the annual improvement in employee safety awareness.

In particular, the year 2024 marks the beginning of the company's systematic approach to safety, a pivotal time requiring active participation in safety activities from all employees. Based on this diagnosis results, each organization is developing and implementing plans to improve the safety culture, and the company monitors improved areas and weaknesses requiring additional reinforcement through annual safety culture diagnosis. Based on this, the effectiveness of safety culture activities will be continuously verified and managed.

Development of Customized Safety Education Programs

Safety Career Path (SCP) Redesigning

Systematic Safety Training, SCP

A training framework has been established and is in operation to provide employees with systematic safety education by tier. In addition to statutory and qualification training, the Safety Career Path (SCP) program has been constructed by building on existing training courses and developing new courses to build internal safety capabilities, which we have been continuously maintaining and developing to date.

In-house Qualification Training Operation

When operating in-house equipment such as crane signals, pendant/remote control cranes, gondolas, and ship cranes, workers must complete relevant qualification training and pass the relevant evaluation. Workers identify the necessary qualifications before work and voluntarily apply for training to obtain qualifications. After obtaining qualifications, they must receive refresher training every year, which is provided in the form of permanent training courses supervised by the Corporate Safety and Health Office.

Recently, to prevent crane accidents, a customized crane signaler qualification training course has been reorganized for inside/outside shop areas.

Statutory Safety and Health Training for Supervisors

Since 2023, as part of our supervisor safety training, we have implemented intensive learning courses on "risk assessment," which is a core element of the site safety management system. In 2024, we focused on enhancing learner immersion and sense of achievement through gamification, case studies, discussions, etc., with themes of ad-hoc/on-site risk assessment and risk assessment summary. Based on our experience in operating these leveled risk assessment training courses, we have been systematizing the entire supervisor safety training programs in phases to continuously provide effective customized training contents.

Foreign Worker Safety Training

Foreign workers are provided with enhanced safety education programs compared to domestic workers, along with leveled safety education courses. The training courses operate on participatory and discussion-based curricula to support effective learning. In addition, interpretation services are provided for on-site safety management activities to continuously improve foreign workers' safety capabilities.

Statutory Training	Non-Statutory Training		
Level 1	**Level 2**	**Level 3**	**Level 4**
Safety and Health Training for New Employees (8 hours)	Foreign Worker Follow-up Course (4 hours)	Foreign Worker Step 1 (4 hours)	Foreign Worker Step 2-1, 2 (4 hours each)

VR Safety Training

Following the introduction of VR experience for safety education for the first time in the industry in 2017, three upgrades have been implemented, and a total of 22 types of VR experience are currently provided across three training rooms and a show-room. Every month, workers vicariously experience the dangers and accidents of actual workplaces at VR safety training rooms installed throughout the site, which offer experiences distinguished from conventional education methods. In addition, the contents from the second development phase (nine contents) and the third phase (nine contents) have been developed in 4 or 5 languages so that foreign workers can also access them.

1st Phase

- Fall (platform dismantling)
- Hot work (cutting a lug)
- 2 practice training contents

2nd Phase

- Struck by (a broken lever puller)
- Caught under (a material that fell while being hoisted by a crane)
- Caught in (a moving forklift)
- Electrocution (distribution panel live parts)
- Work in confined spaces (in blocks)
- Painting (touch-up painting inside a tank)
- Operating hand-held tools (grinder, lever puller)
- Operating a crane, signaling
- Fire (evacuation in case of fire at LPG carriers)

3rd Phase

- Argon-purging of pipes
- Assembly and disassembly of Truss structure
- Being caught in big doors
- Operating winches (cable laying)
- Working on and operating a cherry picker
- Materials transportation
- Operating cranes to assemble engines
- Hydraulic work for HiMSEN Engines

Practical/Experiential Risk Assessment Training (Basic)

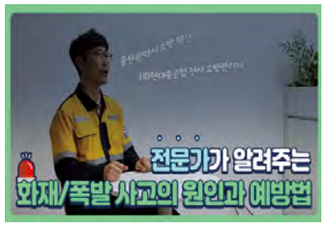
To help on-site workers internalize risk assessment, practical and experiential safety training is provided for five high risk jobs, including “welding,” “fitting grinding,” “piping/outfitting,” “painting,” and “scaffolding.” The training is designed for mutual discussion about risk factors and reduction measures, promoting improved safety awareness, acquisition of new knowledge, and natural communication and sharing. In the future, we plan to launch advanced and practical courses for leveled learning, and expand on the practical/experiential risk assessment training programs.

Safety Culture Promotion Activities

Safety Content Production

Safety Short-form Videos

In line with the recent preference for concise and short video clips, we continue to produce and utilize “safety short form” videos. These clips take a fun spin on various subject matters such as basic rules, traffic rules, safety protective equipment, etc., making it easier for learners to approach the subject of safety. The contents are translated into multiple languages so that foreign workers can enjoy them as well.



Safety Contents for Foreign Workers

We have produced various safety training contents to raise safety awareness among foreign workers. In addition to 11 types of “Safety Guidebooks” translated into major languages, we are working on 7 new language versions for workers from minority language regions. VR safety training content for foreign workers can experience are also translated and dubbed into multiple languages. In particular, we made “pre-entry safety training videos” on the company safety rules, systems, and major risk factors, and “foreign worker safety training videos by discipline” for safe work according to work standards. Continuous efforts are being made to eliminate safety blind spots caused by linguistic and cultural differences and to improve foreign workers’ safety awareness and capabilities.

Safety guidebook for foreigner workers

Safety training video for foreign workers

Safety training video for foreign workers

Installation of Safety Notices

We have set up large signs with fresh and differentiated designs at each entrance and major points to repeatedly deliver positive safety messages. The design of safety golden rules has been renewed using HD HHI's safety character "HIRO" to maximize visual effects. To deliver messages customized for each factory and area, we have been working on posters, pamphlets, and other various media contents designed for wider dissemination of safety messages.


Wider Use of Safety Characters

HIRO, HD HHI's Safety Hero

To create a friendly and positive image of safety, the safety character "HIRO" was developed and first introduced in 2023. Since then, HIRO has been actively featured in various fields, such as safety training content, posting designs, and campaign activities. Going forward, we plan to adopt various measures, including character merchandise, to continue promoting HD HHI's safety culture.



4-4 Management Performance of the Safety Risk Management (SRM) Section

We are focusing on systematically conducting risk identification and safety improvement activities and applying big data and AI-based technologies to the field to develop a “smart and safe shipyard” that proactively predicts and prevents accidents.

SAFETY
HEALTH

Major Achievements of the Safety Risk Management (SRM) Section in 2024

Detailed Action Plan	Implementation Methods	Major Achievements
Enterprise-wide risk finding and safety improvement	**Enterprise-wide Safety Improvement Activities (Hi-SAFE)**	
	Selecting safety improvement tasks across organizations in the company	Held departmental presentation meetings (February 5-16)
	Result announcement - 1H / 2H	Held departmental results report meetings (by September 30)
	Holding a safety project contest / safety award ceremony	Held a safety project contest (December 13)
	Safety Risk Contest	
	Holding a safety risk contest and rewarding excellent ideas	Held a safety risk contest (June 17-28)
	Horizontally deploying outstanding SRM cases across the company / monitoring relevant departments	Worked on addressing 50 high risk factors
	Safety Open Market (SOM)	
	SOM improvement tasks registration and operational management	Registered high risk tasks (2 tasks) and received feedback
	Rewarding the best ideas and applied them to sites for safety improvements	Discussed improvement ideas (October)
	Safety-Production Deliberation Committee	
	Identifying, drafting, and deliberating on agenda items (quarterly)	Held a Safety-Production Deliberation Committee meeting (May 10)
	Implementing deliberated/adopted resolutions / managing improvement status	Improved truss and scaffolding materials
	Site Safety Improvement	
	Continuing to strengthen the safety of three safety facilities (focus on improving ventilation in in-shop factories)	Carried out periodic TF improvements
	Continuing to improve on-site safety facilities and work methods	Carried out on-site improvements and support (98 cases)
Advancing big data-based safety management systems	**Accident prediction system advancement**	
	Loading data of fatality accident prevention measures on the Palantir Foundry	Completed measures to prevent fatality accidents
	Presenting accident prevention activities by linking predicted accidents with measures to prevent fatality accidents	Linked accident data with prevention measures
	Continuing to identify accident prediction factors, and advancing the systems including stabilization	Reorganized accident prediction services (November)
	Continuing correlation analysis	
	Identifying highly correlated factors to improve data quality and analyzing complex correlations between data on the causes of accidents	Incorporated the factor prediction service (November)
	Structuring unstructured accident data	
	Matching unstructured incident data (e.g., instant RCA/PDF, etc.) within the Palantir Foundry	Analyzed non-regular accident data
	Training Palantir / data analytics end users	
	Selecting safety departmental representatives / training and assigning roles for Palantir Foundry and data analytics	Selected responsible personnel at each department
Implementing an AI-based safety monitoring system	**Enhancing object detection and control**	
	Improving small object detection and expanding control capabilities (e.g., presence of fall protection, safety golden rules violations, G/C collision control, etc.)	Completed 70% of small object learning
	Integrating sensor data-based Hi-CAMS	
	Developing complex control functions linked to external data such as temperature/humidity, wind direction/volume, rainfall information, etc.	Applied the In-shop factory sensor data (4BAY)
	Applying portable video analytics (lightweighting) in the field	
	• Developing lightweight portable video analyzers • Selecting high risk work areas in- and out-shops for on-site application	Developed the integrated AI model
	Preparing for Hi-CAMS operation in the integrated control center	
	Conducting Hi-CAMs operation training for integrated control center personnel, enhancing user convenience functions	Hi-CAMs control center fully operational (October)
Improving safety with digital technology	**LiDAR sensor-based accident prevention**	
	Eliminating risk blind spots with LiDAR sensors (such as detecting vehicle/worker collisions at factory gates)	Applied to 4 factory entrances and exits (October)
	Improving TP collision avoidance (AI camera)	
	Developing complex control functions linked to external data such as temperature/humidity, wind direction/volume, rainfall information, etc.	Developed 1 equipment and completed POC (November)
	Improving safety communication for heavy machinery	
	Introducing a two-way short-range wireless communication system between heavy equipment operator and signaler	Completed development (June); conducted field testing
	Improving worker safety environment	
	Introducing smart wearable devices to the workplace / 3D printing to improve tool safety, etc.	Introduction under review

Enterprise-Wide Risk Finding and Safety Improvement

Enterprise-wide Safety Improvement Activities (Hi-SAFE)

Since January 2024, we have selected 239 tasks across 79 departments, followed by enterprise-wide safety improvement activities (Hi-SAFE) until October and a contest in December for outstanding tasks selected from department efforts. In this contest, 12 projects were selected and awarded with a total of KRW 47 million in prize money.

The enterprise-wide safety improvement activities, which began in 2020 and are now in their 5th year, are accident prevention-centered safety management activities in which production, design, and technical research departments identify high risk works that could lead to fatality accidents, proactively establish improvement measures, and implement them.

The theme of the 2024 enterprise-wide safety improvement activities (Hi-SAFE) was "Connected strength builds a safe site. Together we build, safer we move," which conveys the meaning of creating a safer and more efficient workplace through communication and cooperation between departments and with workers. The CEO, business unit heads, and external experts participated as judges to ensure fair evaluation.

Hi-SAFE Contest Tasks

Award	Department	Task Name
Grand Prize	Offshore Structure Design Department, Construction Department 5	Applied construction methods to secure work safety during installation of UCF and Topside modules
Top Prize	Production Support Department 1	Improved and standardized shipboard emergency escape facilities
	Engine Development Department	Safe HiMSEN ammonia engine system design
Excellence Prize	Commissioning Department	Development of visually distinguishable methanol application (world's first)
	Offshore Construction Department 1	Adopted 3D scanning and developed a management system for offshore projects
Participation Prize	Electrical Device Design Department / Machinery Outfitting Department	Standardized propulsion shaft system loading and installation methods
	Naval & Special Ship Outfitting Production Department 1	Improved application of multi-core pulling equipment
	Large Engine Commissioning Department 2	Improved the safety of methanol engines
Safety Improvement Prize	Crane Maintenance Department	Prevention of O.H crane bus-bar fire accidents
	Naval & Special Ship Hull Design Department	Standardization of hull assembly guides and support pieces
	Processing and Sub-assembly Department 2	Safety improvement for machining cut material work
	Outfitting Production Department	Improvement of Pump Tower production method and facilities

Safety Risk Contest

In June 2024, we conducted an enterprise-wide safety risk contest, which serves as a representative channel for communication with the field regarding safety. 694 field risk factors were reported, which confirmed employees' active participation and willingness to create a safe workplace. We will continue to improve the reported items and build a dedicated platform for efficiently managing safety risks, strengthening communication through sharing progress with reporters, and promoting improvement cases on this platform.

	Classification	Description	Action Plan	No. of Cases
RISK Reports	Department-led safety improvements	Department work/ equipment	① Share action list with each department ② Establish action plans for each department ③ Monitor action progress * Categorize/share items requiring horizontal deployment	328 cases
	Enterprise-wide safety improvements	Enterprise-wide common issues		85 cases
	Aged component improvements	Facilities/equipment		76 cases
	Design improvements	Structural changes		14 cases
Commendation improvement cases		Worksite improvements		176 cases
		Subtotal		**694 cases**

Safety Open Market

The Safety Open Market (SOM), an enterprise-wide safety open improvement platform launched in 2021, underwent significant changes this year. SOM is a program that seeks practical alternatives to difficult safety problems through collaboration among all company employees, using open innovation techniques. Notably, this update expanded the system, which was previously only available to direct employees, to include subcontractor personnel. Now, all company employees can act as agents of safety innovation, creating a more comprehensive and effective safety environment. Additionally, risk factors occurring in each department can be directly submitted as SOM agenda items, and suggestions from other workers are accessible in real-time, making SOM a safety improvement platform with both collective intelligence and speed.

In-house media promotional materials featuring SOM

New – Hi-SEs integrated SOM submission system

Safety Environment Improvement Task Force (TF)

In-Shop Factory Environment Improvement TF

An "In-Shop Factory Environment Improvement TF" was launched to promote a safe working environment and increase production efficiency. The TF organization was formed with the cooperation of In-shop & Safety Division, Shipbuilding General Affairs Department, Facility Planning Department, Energy Operation Department, and Business Planning Department. The TF is focused on improving aging in-shop factories and addressing issues such as lack of work/storage space due to block and panel enlargement. Major improvement items include "layout advancement to simplify work/storage zone structure and improve facilities," "color unification of work zones, passages, emergency facilities, etc.," "emergency/safety culture improvements such as standardization of emergency facility arrangement and safety sign postings," and "sanitation/convenience/work facility maintenance such as standardization and expansion of toilet/sink/water purifier arrangement." This TF started activities this year with Hull Shop 1 as top priority. From next year, target factories will be selected based on risk and urgency levels for improvement work.

In-Shop Factory Environment Improvement TF Launch Ceremony

In-Shop Factory Environment Improvement Items

Layout Advancement

Color Unification

Hull Shop 1 Exterior

Crane Safety Accident Prevention TF

Since crane accidents are likely to lead to fatality accidents, thorough prevention and management are essential. Accordingly, this June, a crane safety accident prevention task force was formed, which divided crane accidents into out-shop, in-shop, and advanced crane accidents, and consisted of personnel from safety, production, and asset divisions. The task force conducted an in-depth analysis of the root causes of crane accidents and developed systematic measures for improvement categorized into system, manpower, and technology. In terms of institutions, special crane safety rules, SPOT TBM, and signal operator control systems were newly established to move away from existing practices and build a systematic, safety-centered work environment. In terms of manpower, we sought ways to improve the efficiency and safety of crane operation through appropriate personnel deployment and workforce structure improvements, and prepared training programs for each crane type to improve the professionalism of crane operators and improve the qualification system. In terms of technology, we planned to introduce safety auxiliary devices using various technologies to complement areas lacking in system and manpower improvements, thereby preventing human error and minimizing potential risks during crane operation.

Establishment of Special Crane Safety Rules

Improvement of the Crane Job Training System

Crane SPOT TBM

The new systems and improvement measures to be implemented from November 1 will not be mere declarations. They will be thoroughly implemented and entrenched in the field through various measures. These efforts are aimed at creating a safety-centered work culture, where all workers naturally comply with safety rules during crane operation and systematic management is achieved. Furthermore, these improvements will play a significant role in fundamentally preventing crane accidents and creating a safe and reliable work environment. A workplace with guaranteed safety provides the foundation for increasing workers' trust and efficiency, which will also have a positive impact on overall organizational productivity and stability.

Crane Safety Equipment Standardization TF

Various safety devices and systems were introduced in the past to prevent crane accidents. However, the complex screen configurations and the excessive number of signals transmitted to workers in these systems only increased operators' fatigue and served as a source of confusion, potentially leading to results contrary to the original purpose of preventing safety accidents.
As a fundamental solution to this problem, we thoroughly investigated safety devices for all cranes enterprise-wide and established "Crane Safety Device Standards" to create an efficient standardization plan.

First We are currently developing a platform integrating various collision hazard alerts and safety signals that crane operators face during operation. This integrated safety alert platform will clearly transmit only essential core information to operators, reducing unnecessary confusion and supporting quick and accurate responses in dangerous situations.

Second We are optimizing the interior of crane cabins with ergonomic designs to improve operator convenience and emergency response capabilities. In particular, by improving the layout of monitors and control panels, we are increasing operator visibility and accessibility while carefully designing to minimize fatigue during long work periods.

Third We are establishing a phased and standardized investment plan to make up for the lack of essential auxiliary devices such as CCTV and anemometers. These newly installed devices will play an important role in real-time monitoring of the work sites and quickly detecting changes in external environment, thereby predicting and preventing accident risk factors.

Last For immediate response to safety devices' malfunction or abnormalities, we are developing a computerized management system that unifies the service request reception channels. This system will manage the entire process from failure reporting to handling, enabling prompt repair and maintenance of devices and maximizing site safety.

The efforts of this TF are aimed not only at improving safety devices but also at maximizing the effectiveness of safety auxiliary devices while providing crane operators with a safer and more convenient working environment. Through this, we will fundamentally prevent accidents in crane workplaces and continue systematic improvements and ongoing management to create a "safe workplace with no crane accidents." By actively incorporating operators' opinions in this process and building an advanced safety management system where technology and systems harmoniously work together, we expect to further raise the safety level of the entire organization.

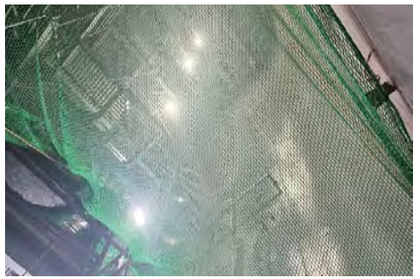
Crane Integrated Safety Alert Platform (Draft)

Crane Cabin Safety Device Monitor Arrangement (Draft)

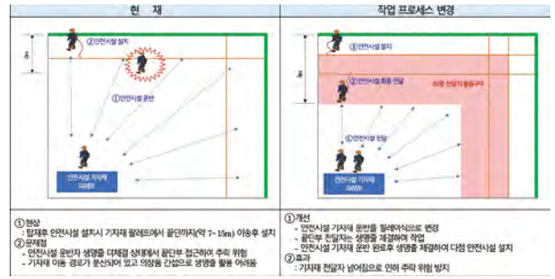
Three Major Safety Facilities - Scaffolding Safety Improvement TF

The Scaffolding Safety Improvement TF, formed in 2022, has continued to identify and review various improvement items by listening to field VOC and has carried out several improvement activities. In particular, a structural analysis program called SIMSOLID was introduced to provide a clear answer to the question often raised in the field, "Is the installed scaffolding safe?" Through this, existing scaffolding installation methods have been thoroughly verified, and improvements have been made in parallel for areas with insufficient safety. We are currently compiling the results of this research and verification into a "Scaffolding Structural Analysis Collection." This collection will analyze the structural safety of various installation cases and organize safe scaffolding installation methods for easy reference and use by colleagues in the field.

Improved fall prevention features such as rescue hole, hatch M/H



Applied off-shore Shenandoah P/F(Hull) fall prevention nets



Established lifeline standards to prevent the fall of workers transporting scaffolding materials

Assessed the structural safety of the scaffolding installation method (SIMSOLID)

Safety-Production Deliberation Committee

The Safety-Production Deliberation Committee serves as a management-level decision-making body to ensure that the company's safety-first policy is not threatened by process instability, cost reduction, etc., and to quickly improve safety risks in the field. Chaired by the Chief Safety Officer and attended by the Head of the Safety Production Division and the Chief Financial Officer, etc., the committee adopts decisions on methods, standard changes, complex process coordination, and urgent safety investments for major risk improvements.

Operating Process for the Safety-Production Deliberation Committee

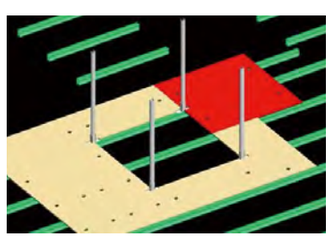
Major risk occurrence	1st review	2nd review	Deliberation Committee
Occurrence of safety risks that affects processes and costs	Working-level review	Submitting agenda to the Deliberation Committee	Hold a Safety-Production Deliberation Committee meeting and notify results
Frequent monitoring of production process	Production/support, design, safety	Safety Risk Management (SRM) Section	

On-site Safety Improvements

We promptly processed various suggestions for safety improvement from our sites and made improvements. In particular, if a relevant department faces difficulty due to budget constraints, we use emergency safety budget system to support safety improvement activities.

1. Introduction of Standardized Scaffolding for Raised Floors

When working on raised floors in offshore construction projects, workers previously installed temporary scaffoldings before floor tile installation by stacking plywood and securing them with cable ties. However, haphazardly stacked scaffolding lacks solid support, creating a risk of falling when workers step on the edges. To address this issue, we used our emergency safety budget so that the Offshore Electrical and Instrument Design Department could modularize the scaffolding. We plan to develop prototypes of these modules and deploy them in our sites.

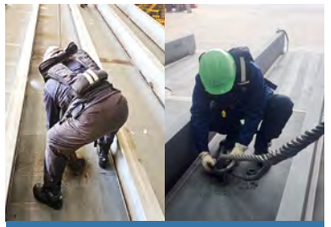


2. Introduction of Wearable Air Bags to Reduce Fall Injury Rates

In in-shop processes, work is sometimes performed on trestle or beam tops where safety harness hooks cannot be attached. In these environments, workers are exposed to risks of serious fall injury. To address this issue, we invested the emergency safety budget to support the pilot introduction of wearable airbags for personnel working on block trestle tops during in-shop processes. Currently, 24 prototype airbags have been provided to the field, and we are considering the possibility of wider application through close communications with actual users.


Non-anchorable work positions for safety harnesses


Wearable airbag (Safe Wear C3)


Workers wearing the airbag

A wearable airbag to reduce fall injury rates for workers working on block tops

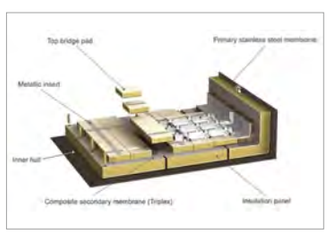
3. Establishment of LNG Carrier Cargo Hold Fire Alarm System and Integration with the automatic fire detection system at the Integrated Control Center

The cargo holds of LNG carriers have a structure that requires high technology and precision, involves high costs, and is virtually unavailable for partial modification. Additionally, while the insulation structures efficiently block heat transfer at the cargo holds, they are vulnerable to fire. Due to these structural characteristics, if initial suppression fails in the event of a fire, the cargo holds face a high risk of rapid fire spread, which could seriously affect the entire vessel's construction schedule.

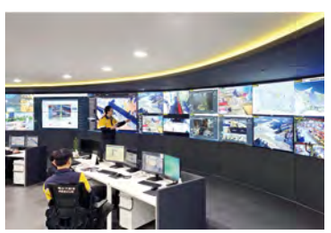
To prevent these risks in advance and ensure a quick response, we invested the emergency safety budget to newly establish an interlinked fire alarm system within the ship. This system is closely linked with the vessel's cargo holds and immediately connects to the automatic fire detection system installed in the integrated control center when a fire is detected.

In case of deterring a fire, this system activates an automatic dispatch system to engage in prompt response in the early stage. The system is expected to effectively suppress fire and ensure the safety of workers. Furthermore, as the system allows for early fire suppression, it will minimize human casualties and economic losses due to fire and strengthen our ability to build LNG vessels in a stable manner.


LNG carrier cargo hold



LNG carrier cargo hold insulation materials


Integrated Control Center

Safety Improvement with Digital Technology

Big Data-Based Safety Management System - Advancement of the Accident Prediction Service

In response to the need for a long-term safety management framework based on big data, we integrate and manage safety data from the three major shipbuilding companies (HD HHI, HD Hyundai Samho, and HD Hyundai Mipo). Starting with the visualization of comprehensive safety status, we have established a prediction model using accident data to provide department managers with information on preventive activities based on likelihood of accidents.

This year, we have taken the existing accident prediction service to the next level, revamping it to provide a service that selects safety work that departments should focus on based on mobile safety work orders and PTW data. This is expected to enable each department to focus on managing high risk work.

In addition, by combining departmental work standard data with a large language model (LLM), we have built a chatbot demo service. This chatbot provides real-time safety information needed in the field, laying the foundation for growth into a "safety AI agent" in the future. This technological innovation will be a cornerstone for making safety management more efficient and intelligent.

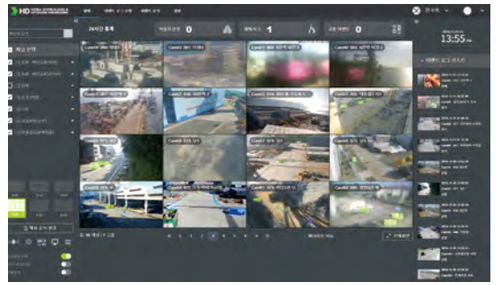
In the future, we will continue to research and improve specific implementation items to achieve a "visible and predictable safety system" in line with the Safety Vision 2027 strategy. Based on big data and AI technology, we will do our best to realize proactive accident prevention and build a safer and more reliable work environment.

Accident prediction email service improvement (Today's Work Focus)
* Safety AI Agent: uses safety, production, and real-time field data to provide personalized safety information (service set to launch in 2025 2H)

Implementation of an AI-based Safety Monitoring System - Hi-CAMs Official Launch

"Hi-CAMs," which was initially developed as a fire detection system for vessels and later expanded into a yard safety control system, began its official operation at the recently renovated Integrated Control Center. Currently, 117 CCTV channels within the yard are linked to the Hi-CAMs system at the Integrated Control Center, completing a framework that allows for real-time screening and monitoring of hazardous situations on site and enables swift response. The official operation of Hi-CAMs is expected to serve as a significant opportunity to further strengthen on-site safety management and greatly improve accident prevention and safety through preventive monitoring and immediate response.

Hi-CAMs at the Renewed Integrated Control Center



Hi-CAMs Yard Safety Control System

The main yard safety control functions of Hi-CAMs include.

Fire/Smoke Detection

Quickly detects fires and smoke that may occur in the yard, enabling early response

Detection of Abnormal Worker Behaviors

Monitors workers for abnormal behaviors to identify potential hazards early on, such as falling, SOS signals, and crowd behaviors

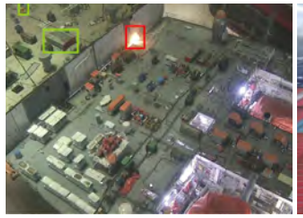
Heavy Equipment Collision Detection

Detects collisions between heavy equipment in real time and provides immediate warnings

Road Traffic Control

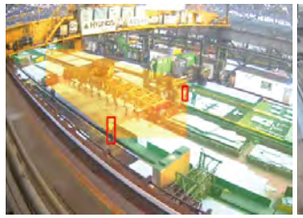
Monitors speeding, illegal parking, traffic volume, etc. to manage traffic flow and safety

In addition to these features, the Hi-CAMs system can detect 20 different types of dangerous situations, identifying and screening real-time hazards on-site to support prompt response. This helps us prevent safety accidents and maintain a safe working environment.




Fire/Smoke Detection

Detection of Abnormal Worker Behaviors




Heavy Equipment Collision Detection


Road Traffic Control

Application of Digital Technology to On-site Facilities and Equipment ①

Prevention of Factory Entrance Safety Accidents

To prevent collisions between forklifts and vehicles at factory entrances, we have introduced the latest technology in collaboration with external venture companies and built customized safety systems adapted to on-site conditions using advanced technologies such as LiDAR and AI cameras.

LiDAR technology tracks the location and movement paths of forklifts or vehicles in real time through 3D scanning, while AI cameras analyze collision risk factors based on this information and provide warning signals. These technologies are combined to prevent collision accidents around factory entrances and improve the work environment to make it safer.

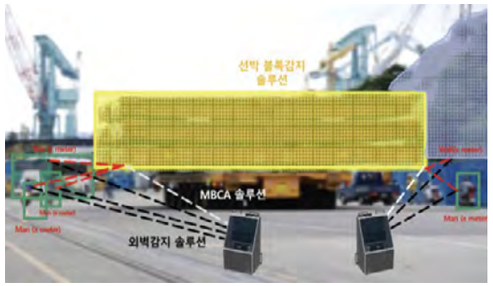
With this improvement, we plan to activate real-time monitoring and automatic warning systems, minimizing risk factors that may occur at entrances and further strengthening systems that ensure the safety of both workers and vehicles.

Factory Entrance Collision Avoidance System

Application of Digital Technology to On-site Facilities and Equipment ②

Improvement of Transporter (TP) Collision Avoidance

We are developing a system that uses AI cameras and video analysis technology to prevent collision risks between transporters carrying large and heavy objects in the yard and interferers in their surroundings. This system is designed to monitor the transporter's route and surrounding environment in real time, detect collision risks, and prevent block tipping or collision accidents in advance. In particular, to prevent accidents due to night work or human error, AI cameras analyze the environment regardless of day and night, and automatically warn or determine safe driving routes even when drivers fail to recognize risk factors. This helps eliminate high risk work factors in advance and supports safer and more efficient transportation of heavy objects. This development is expected to minimize collisions and accidents, greatly improving not only worker safety but also the overall safety within the yard.



Factory Entrance Collision Avoidance System

4-5 Management Performance of the Safety Inspection Section

Based on risk assessments and measures to prevent fatality accidents, we are focusing on gray zones in the blind spots of interorganizational management to diagnose, improve, and horizontally spread risk reduction activities.

Potential compliance risks are also addressed through inspections of safety and health-related laws and regulations, and safety diagnosis, guidance, and support activities are conducted for in-house and external subcontractors.

SAFETY
HEALTH

Major Achievements of the Safety Inspection Section in 2024

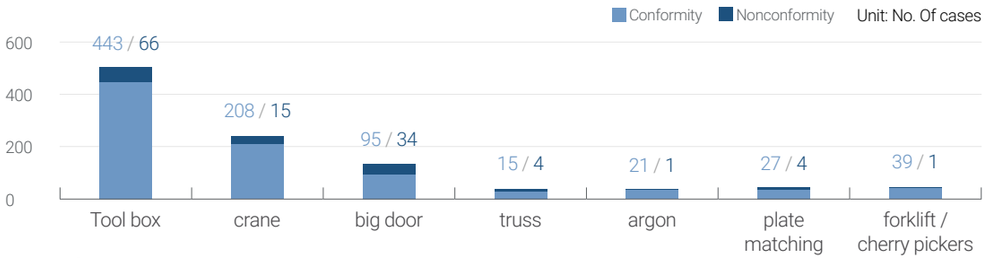
Detailed Action Plan	Implementation Methods	Major Achievements
Expanding safety technical guidance/ support for external subcontractors	**Reinforcing the safety culture level assessment system**	
	• Expanding the number of target companies and conducting twice a year (first and second half) • Conducting inspections/coaching focused on preventing major accidents (on-site safety management) • Inspecting/establishing a safety and health management system in response to the Serious Accidents Punishment Act (system)	• Increased the number of companies to receive tech support from external subcontractors from 40 → 60 companies and completed on-site technical supervision • Provided safety and health work guidelines and emergency response manuals • Completed joint safety technical supervision with the MOEL (6 companies) • In-house safety practice benchmarking (2 companies) • Safety special lectures for supervisors (2 companies) • Shared safety and health technical materials (ongoing)
Reviewing the risk assessment internalization progress	**Building a safety and health management system through risk assessment advancement**	
	• Performing during safety regulation inspections (twice a year) • Reviewing horizontal deployment and incorporation of hazard risk assessment/corrective measures • Areas: appropriateness of high risk work ratings by department, RCA results (countermeasures) for major accidents, causes and countermeasures for fatality accidents at similar companies	• Reviewed compliance with safety and health-related laws for 1H Conducted for 79 organizations enterprise-wide 398 nonconformities identified / 398 corrected • Reviewed compliance with safety and health-related laws for 2H Conducted for 81 organizations enterprise-wide 272 nonconformities identified / 260 corrected
Checking the implementation of measures to prevent the recurrence of major accidents	**Establishing/operating the on-site self-regulated safety management system in the relevant departments**	
	• Analyzing major accidents over 5 years and establishing quarterly safety inspection plans • Reviewing the implementation and effectiveness of major accident recurrence prevention measures • Checking the status of self-compliance with job standards / safety rules through frequent inspections • Reducing the probability of accidents by correcting nonconformities immediately	• Conducted a compliance inspection of prevention measures against recurring fatality accidents 96 unsafe conditions identified / 91 corrected • 4S-based high risk work safety diagnosis 551 unsafe conditions identified / 535 corrected • Production core facilities/equipment safety diagnosis 488 unsafe conditions identified / 468 corrected • Special safety diagnosis 365 unsafe conditions identified / 331 corrected • Completed revision of 45 risk assessments

Intensive Safety Inspection for High Risk Work

Compliance Inspection of Prevention Measures Against Recurring Fatality Accidents

We are intensively managing the implementation of recurrence prevention measures for 11 fatality accidents that occurred over the past 7 years. We inspect unsafe factors and unimplemented recurrence prevention measures on-site and improve them together with the relevant organizations, analyze and provide feedback on risk assessments linked to fatality accident prevention measures, and continuously carry out activities to improve on-site safety risk management and implementation levels.

Classification	Inspection Topics	1H	2H	Total
No. of inspections	Tool box, crane, big door, truss, argon, plate matching, forklift / cherry pickers	699	274	**973**
Nonconformities		85	40	**125**
Nonconformity rate		12%	15%	**13%**



* Nonconformity improvement rate: 100%

4S-Based High Risk Work Safety Diagnosis

Using the 4S (STOP-STAY-SEE-SAY) technique, we check for unsafe behaviors and non-compliance with job standards that may occur during workers' production activities, and conduct worker interviews to encourage behavioral improvement to address root causes. In addition, we maintain a continuous communication system with the relevant departments by analyzing job standards and risk assessments to ensure that the production site complies with job standards. In 2024, we inspected 2,145 cases related to 24 major works and identified and improved 551 unsafe behaviors.

Classification	Q1	Q2	Q3	Q4
No. of inspections	850	664	524	107
No. of unsafe items	172	221	130	28
Corrections completed	172	221	130	28
	100%	100%	100%	100%

Core Production Facilities/Equipment Safety Diagnosis

We continue to inspect the overall safety management status of production core facilities and equipment, such as docks and quay walls, and communicate with management organizations to proactively break the chain of unsafe conditions caused by omissions in daily management.

Classification	Q1	Q2	Q3	Q4
No. of inspections	260	-	392	750
No. of unsafe items	61	-	72	355
Corrections completed	61	-	72	322
	100%	-	100%	91%

Special Safety Diagnosis (High Risk Organizations, Major Accidents, Foreign Worker Safety Management, etc.)

We conducted special safety diagnoses and improvement activities to address various situations. The activities included assessment of organizations where safety alerts were issued due to abnormal increases in accidents and rule violations, urgent in-house safety diagnoses following fatality accidents at similar companies, and inspection of the safety management status of increasing foreign workers. By sharing the diagnosis results, we encouraged production departments to independently establish prevention measures and educate workers, performing proactive activities to prevent accidents.

Classification	Q1	Q2	Q3	Q4
No. of inspections	191	421	101	1,017
No. of unsafe items	11	144	49	161
Corrections completed	11	116	49	148
	100%	81%	100%	92%

Risk Assessment Safety Feedback

We continued to provide intuitive feedback to production organizations by reviewing compliance with the related laws, work standards, and safety guidelines in risk assessments, which constitute the core of self-discipline prevention systems, as well as the subdivision of unit work and the appropriateness of risk levels and improvement measures. As a result, we revised 45 risk assessments in Hi-standard, identifying and eliminating potential risk factors in the site to minimize risks. We also continued worker training at production departments and horizontal deployment across related departments.

Risk Assessment Review Details in 2024

(Unit: Case)

Risk Assessment	Work Description	Risk Factors	Frequency/Intensity	Reduction Measures
45	190	731	729	852

Compliance Assessment for Safety and Health Laws and Regulations

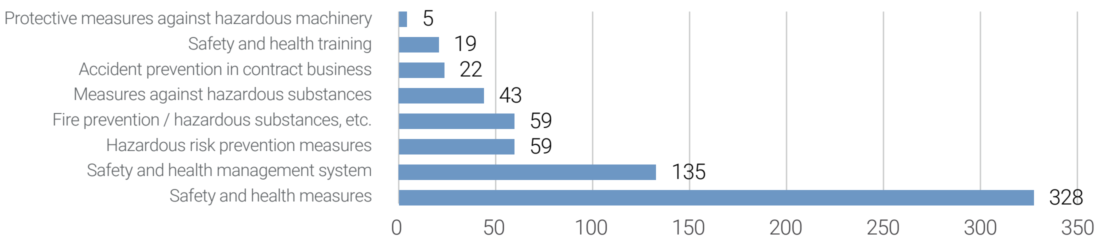
Compliance Inspection for Safety and Health Laws and Regulations

Proactive Management to Fulfill Obligations under Related Laws

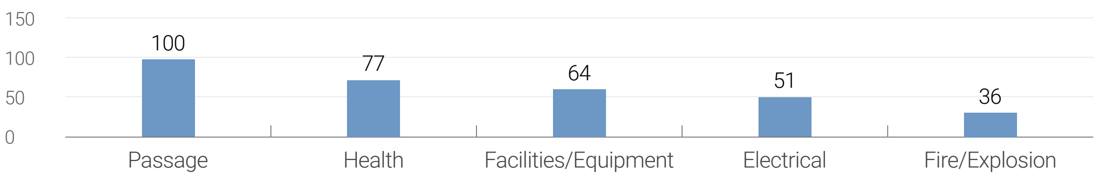
The implementation of the Serious Accidents Punishment Act has put emphasis on the importance of compliance with various laws including the Occupational Safety and Health. To eliminate potential compliance risks and increase the implementation rate of related laws, we conduct enterprise-wide implementation inspections at least once every six months to review the operability of the safety and health management systems and provide guidance, advice, and improvements. We inspected 81 departments across the company, once in 1H and followed by another in 2H, through which we identified 398 legal non-conformities in the first half and 272 in the second half, and completed improvements through communication with the relevant departments. We continuously analyze recurring problems and major issues to improve the system and prevent their recurrence, while also carrying out ongoing activities to ensure that all organizations within the company internalize basic legal compliance.

Classification	No. of Findings	Percentage	No. of Actions	Action Rate
Occupational Safety and Health Act / Enforcement Decree / Rules	590	88%	576	98%
Related laws (Serious Accidents Punishment Act / Act on the Safety Control of Hazardous Substances / Framework Act on Firefighting Services / Chemical Substances Control Act, etc.)	80	12%	79	99%
Total	670	-	655	98%

Nonconformities by Inspection Item



Nonconformities within Safety and Health Measure Items

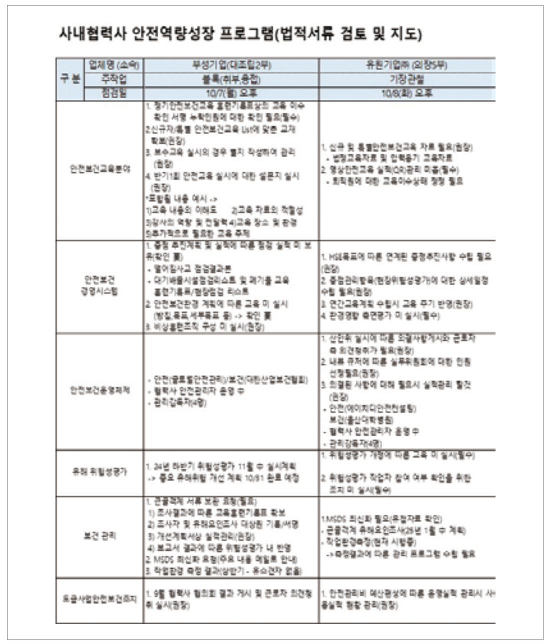


Comprehensive Safety Management Support for In-house Subcontractors

Safety Technical Support for New Subcontractors

We provided safety management technical guidance to 15 new subcontractors on in-house safety management policies such as compliance with safety systems and safety support systems, and legal compliance with safety/health-related laws such as the Serious Accidents Punishment Act and the Occupational Safety and Health Act, to help them adapt quickly to in-house operations and stabilize their production activities. Through more than three rounds of technical support per subcontractor, we encouraged subcontractor business owners to establish safety management systems and supervisors to conduct proactive safety management activities.

Phase (Month)	Main Technical Guidance Items
1st	Introduction to in-house safety policies and safety management capability diagnosis
2nd	Review and guidance on legal documents (key provisions of the Occupational Safety and Health Act and document preparation and management direction)
3rd	Subcontractor safety level simulation evaluations and on-site safety guidance (based on past rule violations)
Common	Provision of materials related to in-house safety systems and systems (12 items)

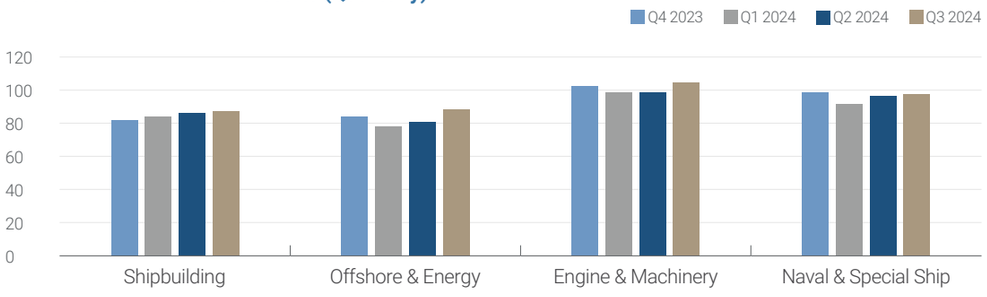

사내협력사 안전역량성장 프로그램(법적서류 검토 및 지도)

Subcontractor Safety and Health Level Assessment and Incentives

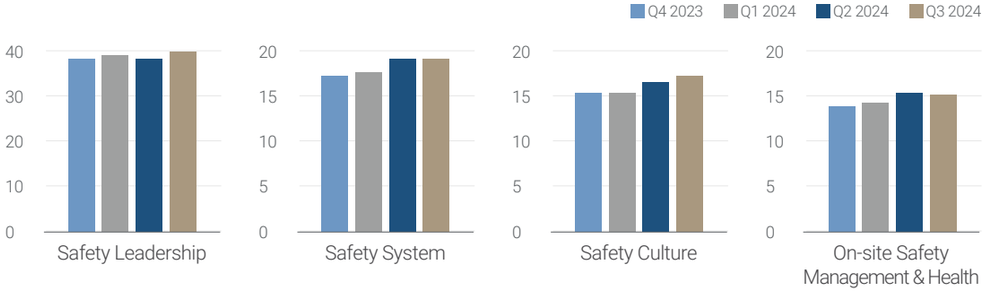
HD HHI runs a program to evaluate and provide incentives based on the safety and health levels of in-house subcontractors every quarter. To help subcontractors mitigate compliance risks and improve accident prevention effectiveness during their self-assessment preparation process, we have established evaluation criteria such as subcontractor representatives' safety leadership, safety management systems, safety culture, health management, and on-site safety management levels. In 2024, 27 outstanding subcontractors were rewarded with KRW 10 million each (KRW 5 million in safety incentives and KRW 5 million in safety material purchase support).

2024 Incentives Status	Shipbuilding	Offshore & Energy	Engine & Machinery	Naval & Special Ship
Subcontractors (No.)	21	2	4	2
Incentive Amount (KRW 1,000)	210,000	20,000	40,000	20,000

Business Unit Evaluation Results (Quarterly)



Assessment Indicators Evaluation Results (Quarterly)



Safety Technical Guidance for In-house Subcontractors

HD HHI selects subcontractors in need of safety management system improvement after evaluating their safety and health levels and provides multifaceted support to help them establish a more effective and autonomous safety management system. To this end, we provide specific improvement measures to help subcontractors introduce and operate autonomous safety management systems, and provide detailed technical support on matters related to the implementation of safety and health-related laws based on the Serious Accidents Punishment Act. In addition, we actively support subcontractors to not only meet legal requirements but also continuously improve their on-site safety management level by providing practical help on items to comply with in-house safety and health systems.

In-house Subcontractor Safety Management Agency Meeting

We hold periodic meetings with external safety management agencies that provide statutory safety management services for in-house subcontractors. We discuss and build consensus on compliance with related laws based on the Serious Accidents Punishment Act, HD HHI safety policies and standards, basic safety management systems, and safety trends, and engage in continuous efforts to align the direction of technical guidance that varies by agency to build the safety management execution capability of in-house subcontractors.

Operation of the Subcontractor Safety Manager Support System

Subcontractor Safety Manager Support

HD HHI operates a subcontractor safety manager support system to help establish self-regulated safety systems for in-house subcontractors. To enable work in a safe environment by identifying and eliminating risks in the work areas of in-house subcontractors in advance, we provide monthly operational support funds for up to two safety managers, depending on the size of the workplace. We also conduct one-on-one mentoring with safety supervisors to help them respond to risks, and hold training sessions and meetings on a regular basis to help subcontractor safety managers become "safety experts" who can prepare for their subcontractors' compliance risks. In 2024, we provided approximately KRW 6.6 billion in support funds to a total of 282 safety managers.

Classification	Shipbuilding	Offshore & Energy	Naval & Special Ship	Engine & Machinery	Corporate Safety and Health Office	Total
No. of Personnel	224	11	13	31	3	**282**

Subcontractor Safety Manager Capability Evaluation and Incentives

HD HHI evaluated the capability levels of in-house subcontractor safety managers and awarded a total of KRW 8 million to 16 outstanding subcontractor safety managers annually. In addition, we provided one-on-one coaching to new safety managers and safety managers in need of technical guidance.

Imposition of the Obligation for KOSHA's "Risk Assessment Excellent Workplace Accreditation" and Support

HD HHI supports in-house subcontractors in obtaining the "Risk Assessment Excellent Workplace Accreditation" provided by the KOSHA for small businesses with fewer than 100 employees, to establish a risk assessment system. As key points, we are continuously providing technical support to enable accurate establishment of risk levels and improvement measures by further segmenting unit operations through the use of systems (Hi-Standard, mobile safety work order) capable of implementing periodic, ad-hoc, and on-site risk assessments, and through reviews and feedback on completed risk assessments.

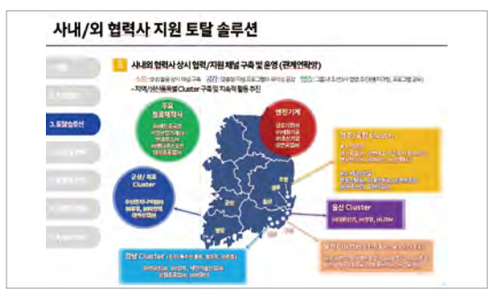
Classification	Businesses with fewer than 100 employees (including accredited subcontractors)	Accreditation obtained	Accreditation rate	Accreditation obtained in 2024
Shipbuilding Business Unit	114	76	67%	37
Offshore & Energy Business Unit	19	2	11%	-
Naval & Special Ship Business Unit	8	7	88%	4
Engine & Machinery Business Unit	20	17	85%	7
Management Support	5	4	80%	3
Total	**166**	**106**	**64%**	**51**

Total Solution Technical Support for External Subcontractors

Total Solution Technical Support for External Subcontractors

HD HHI has signed business agreements with major external subcontractors (40 companies) and operates support and cooperation systems to help external subcontractors secure production stability through technical support in various areas, such as safety, facility/equipment maintenance and repair, and manpower supply and training. To this end, we combined various programs operated by the Safety Division, Asset Division, and Shared Growth Office with existing technical support from the Safety Division, and established a technical support system that provides practical help to external subcontractors through interdepartmental collaboration. We also established a constant communication system with external subcontractors and visited them once every six months in 2024 to build relationships and provide technical inspections and guidance.

HD HHI-External Subcontractor Total Solution Technical Support Agreement Ceremony



Establishing an Autonomous Safety System with Self-Discipline Prevention Based on Risk Assessment

We have signed business agreements with 20 small-scale workplaces that are struggling to establish safety and health management systems in line with the expanded implementation of the Serious Accidents Punishment Act (applied to workplaces with fewer than 50 employees, January 27). Under these agreements, we visited these workplaces to provide safety technical support based on risk assessment, and offered specialized safety management measures for each workplace. In addition, we cooperated with the MOEL and the KOSHA to conduct technical guidance activities together, and provided customized consulting to help each partner company establish a self-disciplined prevention system that can autonomously manage safety. This support activity focused on helping small-scale workplaces not only meet legal requirements but also achieve practical accident prevention effects.

Safety Special Lectures for External Subcontractor Supervisors

HD HHI visited external subcontractors to conduct special safety lectures to help them prepare for the Serious Accidents Punishment Act. These lectures focused on the key roles and responsibilities that supervisors should perform on-site, particularly covering practical management methods for preventing fatality accidents and specific content on fulfilling legal obligations. Through these activities, we sought to provide practical help for partner companies to effectively prepare for the Serious Accidents Punishment Act and create a safe working environment.

Safety Benchmarking for External Subcontractors

HD HHI invited external subcontractors to provide opportunities to benchmark our advanced safety management systems and on-site safety facilities and equipment. The safety benchmarking event was designed to allow partner companies to learn safety management know-how that can be practically applied on-site, and to directly experience the operation of advanced equipment and systematic management systems. Through these activities, we sought to raise the safety management level of partner companies to the next level and support the creation of a safer working environment.

4-6 Management Performance of the Safety Supporting Section

HD HHI will actively promote safety work to promote safer workplaces by operating a quick and systematic emergency response system through proactive safety management, complying with legal requirements through smooth internal and external safety management cooperation, and preventing accidents through practice-oriented safety management.

SAFETY
HEALTH

Major Achievements of the Safety Supporting Section in 2024

Detailed Action Plan	Implementation Methods	Major Achievements
Enhancing safety management execution through proactive management of legal risks	**Conducting government-related (including the MOEL and the KOSHA) affairs**	
	Complying with an improvement order issued by the MOEL (safety and health supervision, various inspections, etc.)	Responded to improvement measures for supervision/diagnosis/ correction issues
	Developing a plan to manage major violations in the event of a MOEL inspection	Established management measures for major violations 1. Established a joint safety inspection plan with safety and health manager participation for subcontractors 2. Revised the special management material handling log format 3. Improvement of hazardous machinery and equipment systems in progress
	Addressing stakeholder complaints and accusations	Completed the witness investigation process related to the cases
	Devising measures and responding to ambiguous provisions in the safety-related laws, regulations, and standards	Conducted cherry picker regulation improvement meeting / identified need for improvements in MOEL-led shipbuilding businesses, improvement deemed unnecessary for other businesses
	Labor union–related affairs	
	Holding Occupational Safety and Health Committee meetings	Meetings held in Q1 and Q2, with additional meetings scheduled for Q3 and Q4
	Continuous management of the performance of the agreements made in the Occupational Safety and Health Committee meetings (frequent working-level consultation on current affairs)	Management of Occupational Safety and Health Committee implementation in progress
	Joint labor-management inspections	Fully implemented the planned inspections
	Advancing the management system for hazardous machinery and equipment	
	Conducting periodic and occasional inspections on each machinery and equipment subject to statutory inspection	Completed the 1H inspection, and the 2H inspection in progress
	Enhancing computerized/standard systems for managing equipment subject to statutory inspection	Construction completed
	Conducting self-safety inspections of mechanical equipment not subject to statutory inspection and preparing management plans (cranes and hoists under 2 tons, etc.)	Scheduled for 2H
Improving PSM practices to boost ratings and execution	**Improving the PSM rating**	
	Improving the PSM rating	Completed PSM plan reporting and approval; other related work currently in progress
	Conducting inspections under the direction of the MOEL on the status of PSM performance	Completed in 2024 1H
	Conducting internal audits on the status of the PSM operation in the workplace	Completed in December 2024
	Preparing and submitting a checklist for the PSM danger alert system	Completed submission for all four quarters
	Fire/explosion risk management	
	Designating and managing explosion hazardous locations across the company	Completed setting and notification
	Devising improvement plans concerning the requirement to designate explosion hazardous locations in painting shops in the shipbuilding industry	Completed the establishment of improvement measures
	Improving safety management concerning firefighting and hazardous substances	
	Improving compliance at paint factories, engine commissioning sites, and other hazardous substances workplaces	Obtained installation permits for all 16 painting shops Completed acquisition for 3 out of 4 engine shops
	Installing smart flame detectors in buildings without detectors	ompleted construction at 5 out of 17 approved locations
	Establishing comprehensive measures for fire safety management for foreigners	Conducted fire safety experience education, joint nighttime training at dormitories, Created and distributed leaflets and posters, conducted workshops for subcontractor safety managers
	Completing statutory practical training for fire and hazardous sub-stances safety managers	12 managers, 42 assistants completed training
	Conducting statutory inspections of firefighting facilities (precision and operational function inspection)	Completed inspection of 187 locations enterprise-wide
	Maintaining normal operations of enterprise-wide automatic fire detection system, etc.	Monthly inspections and sporadic signal measures completed for 112 locations in main factory and 24 offshore locations
	Conducting a fire insurance inspection to calculate fire insurance premium rates	Completed implementation on September 2, 2024
	Complying with fire department improvement orders	Fire safety inspection (conducted October 21-22: 15 corrective actions, 1 improvement recommendation), completed corrective actions within deadline (by November 22)
Enhancing capabilities by advancing disaster prevention and disaster response	**Advancing safety monitoring systems**	
	Minimizing and continuing to addressed blind spots in safety man-agement monitoring	Completed new installation/replacement of 22 locations
	Establishing a disaster response monitoring system	Completed construction in Q3 2024
	Introducing a video-based hazard analysis system (Hi-CAMS)	Completed introduction in August 2024
	Introducing emergency reporting systems/procedures for foreign workers	Established and currently implementing the relevant procedures

Public-Private and Labor-Management Collaboration in Safety Activities

Strengthening of External Agency Collaboration

Safety and Health Supervision / Safety Diagnosis

We conducted safety and health supervision and safety diagnosis led by the MOEL following the occurrence of fatality accidents. Through this, we identified areas requiring improvement such as the safety and health management system, risk assessment, and on-site issues, and we plan to actively address them in the future.

Safety and Health Supervision & Safety Diagnosis Results in 2024

Major Action Requirements	Safety and Health Supervision	Safety Diagnosis
Fall/hit	14 cases	8 cases
Machines/equipment/facilities	6 cases	6 cases
Electrical safety	3 cases	0
Prevention of fires/explosions	9 cases	14 cases
Others	5 cases	9 cases
Total	**37 cases**	**37 cases**

Joint On-site Patrol Inspection with the MOEL

We conducted joint on-site patrol inspections with the MOEL to address poor practices related to safety and health in the workplace.

We strive to raise safety awareness among all employees by encouraging proactive and initiative safety activities that identify and improve risk factors in advance.

We will continue to do our utmost to prevent accidents through preventive safety management.

Reinforcement of Labor-Management Safety Activities

Occupational Safety and Health Committee

We hold Occupational Safety and Health Committee meetings every quarter in cooperation with the labor union to ensure employees can work in a safe environment. At the meetings, members discuss safety and health issues in the workplace, and the company actively implements the discussion results, such as safety facility improvements and accident prevention activities.

Operation of the Occupational Safety and Health Committee in 2024

Periodic Occupational Safety and Health Committee Meetings

- **Q1** **11 items** including tower crane anemometer installation
- **Q2** **12 items** including improvement of industrial accident return-to-work procedures
- **Q3** **9 items** including improvement of cherry picker qualification certification
- **Q4** **8 items** including improvement of dock safety facilitie

Temporary Occupational Safety and Health Committee Meetings

- **1st** **10 items** related to serious caught-in accidents
- **2nd** **5 items** related to offshore fatality accidents
- **3rd** **8 items** related to forklift major accidents

Joint Labor-Management Safety Inspections

The company and labor union conduct joint inspections for 16 days every month and joint inspections with honorary occupational safety inspectors for 5 days to strengthen on-site safety. Through this, we together as partners in win-win cooperation to address unsafe factors and create a safe working environment.

Major Findings	Inspections / No. of Actions
Fall/hit	115 cases
Machines/equipment/facilities	53 cases
Electrical safety	36 cases
Prevention of fires/explosions	116 cases
Safety passage/lighting	121 cases
Hazardous substances	42 cases
Confined spaces/ventilation	23 cases
PPEs	3 cases
Others	118 cases
Total	**627 cases**

Ulsan Dongbu Fire Station Cooperation Project

2024 Dongbu Fire Station-HD Hyundai Group Workshop

The Ulsan Dongbu Fire Station and HD Hyundai Group members in the Ulsan area held a fire safety workshop to share the latest fire safety issues and discuss fire safety measures and key fire safety activities for each company. In addition, a public-private collaborative workshop was held for subcontractors employing foreign workers who frequently handle hazardous substances in-house, to explain key matters related to fire prevention and hazardous substances and conduct a Q&A session.

2024 In-house Foreign Worker Firefighting Leader Training

In collaboration with the Ulsan Dongbu Fire Station, we engage in various fire safety management improvement activities at the multipurpose training ground for foreign workers in-house, including emergency escape, fire extinguisher/fire hydrant practice, distribution of fire safety leaflets in various languages, etc. In particular, by selecting fire safety “key-men” among foreign workers, we provide training focused on voluntary participation rather than one-sided lectures, enhancing awareness of fire safety and training for actual situations. Through these efforts, we implement our plan to improve foreign workers' voluntary participation and emergency response capabilities.

2024 Joint Public-Private Foreign Worker Dormitory Fire Evacuation Drill

In September, we conducted an emergency evacuation drill assuming a fire situation and provided education on the use of fire extinguishers/fire hydrants and descending life lines for dormitories (Gisuljae) where in-house foreign workers live, in collaboration with Dongbu Fire Station. This drill, conducted jointly with about 500 foreign workers from various nationalities, including Vietnam and Sri Lanka, HD HHI, and the Dongbu Fire Station, strengthened emergency response capabilities using fire safety key-men among foreign workers and “Common Fire Language” leaflets.

Establishment of a Safety Management System for Self-Regulated Safety Management

Advancement of the Management System for Hazardous Machinery and Equipment

Hazardous Machinery and Equipment Safety Inspection To-do List

We minimize risks by conducting regular statutory safety inspections in accordance with the applicable regulations. We have computerized in-house hazardous machinery and equipment-related tasks to build a system where each personnel can view and manage machine and inspection information in real time. In addition, to strengthen compliance with statutory safety inspections, automatic alarms and guidance are provided according to equipment type and inspection cycle, enabling more accurate and efficient management of hazardous machinery and equipment.

Results of Statutory Safety Inspections for 2024

(Units: No. of cases)

Classification	Crane	Lift	Pressure vessel	Industrial robot	Gondola	Completion rate
1H	513	2	175	-	-	100%
2H	287	6	153	2	-	100%

Internal Safety Inspection for Cranes Under 2 Tons

We conduct safety internal inspections for hazardous machinery and equipment under 2 tons, which are not regulated by legal requirements, in collaboration with external specialized institutions to objectively ensure continuous safety performance.

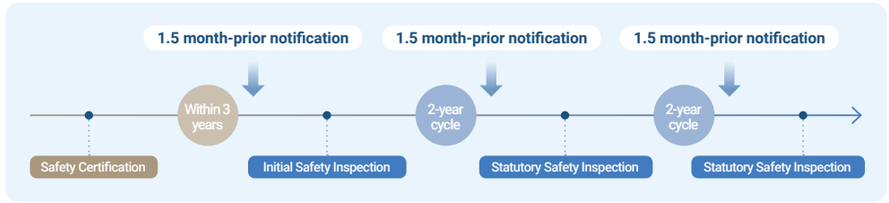
Safety Internal Inspection Performance in 2024

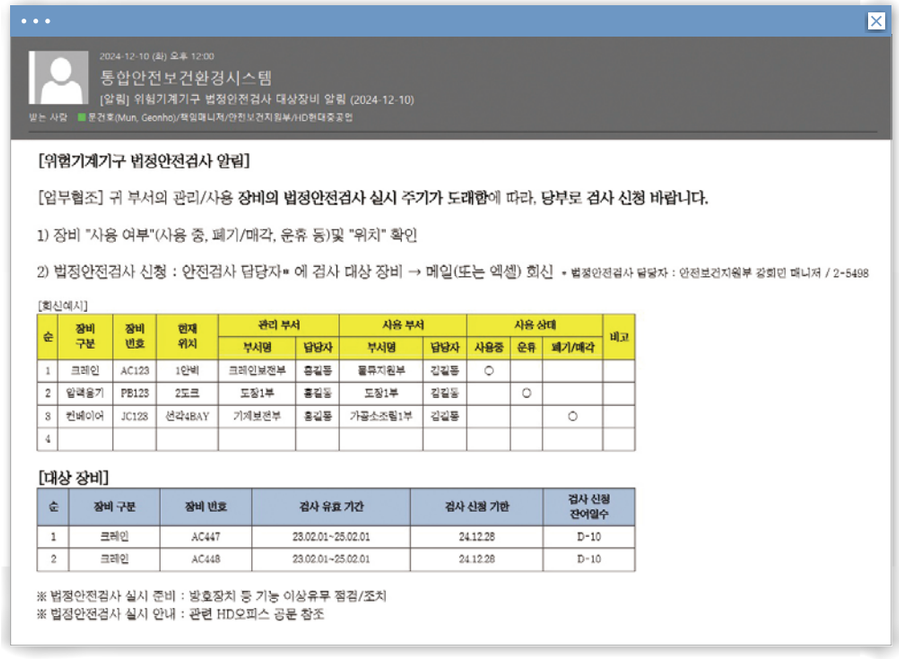
(Units: No. of cases)

Classification	Overhead crane	Monorail	Semi-gantry	Jib crane	Others	Total/ Completion rate
Target	12	31	9	91	3	146
Completed	12	31	9	91	3	100%

Computerization of Hazardous Machinery and Equipment Statutory Safety Inspection Cycle Management

We have built a system that automatically sends notifications and guidance to relevant departments and personnel 45 days before the inspection date to thoroughly prepare for and comply with the statutory safety inspection of in-house hazardous machinery and equipment. The system has enabled more accurate and efficient management of hazardous machinery and equipment.





2024-12-10 (화) 오후 12:00

통합안전보건환경시스템

[알림] 위험기계기구 법정안전검사 대상장비 알림 (2024-12-10)

받는 사람 ■ 문건호(Mun, Geonho)/책임매니저/안전보건지원부/HD현대중공업

[위험기계기구 법정안전검사 알림]

[업무협조] 귀 부서의 관리/사용 **장비의 법정안전검사 실시 주기가 도래함**에 따라, **당부로 검사 신청 바랍니다.**

1) 장비 "사용 여부"(사용 중, 폐기/매각, 운휴 등)및 "위치" 확인

2) 법정안전검사 신청 : 안전검사 담당자* 에 검사 대상 장비 → 메일(또는 엑셀) 회신 * 법정안전검사 담당자 : 안전보건지원부 강희민 매니저 / 2-5498

[회신예시]

순	장비 구분	장비 번호	현재 위치	관리 부서		사용 부서		사용 상태			비고
				부서명	담당자	부서명	담당자	사용중	운휴	폐기/매각	
1	크레인	AC123	1안벽	크레인보전부	홍길동	물류지원부	김길동	○			
2	압력용기	PB123	2도크	도장1부	홍길동	도장1부	김길동		○		
3	컨베이어	JC123	선각4BAY	기계보전부	홍길동	가공소조립1부	김길동			○	
4											

[대상 장비]

순	장비 구분	장비 번호	검사 유효 기간	검사 신청 기한	검사 신청 잔여일수
1	크레인	AC447	23.02.01~25.02.01	24.12.28	D-10
2	크레인	AC448	23.02.01~25.02.01	24.12.28	D-10

※ 법정안전검사 실시 준비 : 방호장치 등 기능 이상유무 점검/조치
※ 법정안전검사 실시 안내 : 관련 HD오피스 공문 참조

Advancement of Integrated Control Center Operation

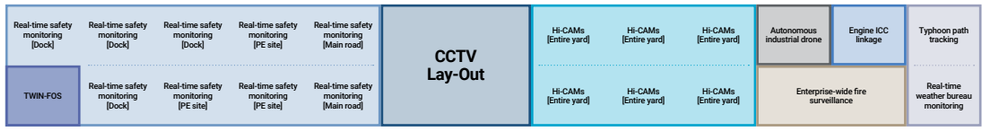
Integrated Control Center Advancement Completed

Corporate Safety and Health Office Integrated Control Center Advancement Completed

We have completed the advancement of the Integrated Control Center, which performs enterprise-wide emergency situation prevention and response functions. Through real-time safety monitoring and automatic fire surveillance from various locations throughout the company, we take immediate, appropriate measures in emergency situations to minimize damage. Compared to the previous version, we have expanded the monitoring servers and equipped them with UPS and fail-over functions to strengthen system stability. We have also introduced the latest AI technology-based intelligent safety monitoring platform and autonomous industrial drones to enable more rapid and accurate situation assessment.

Main Functions

- Real-time safety monitoring
- Hi-CAMs operation
- Autonomous industrial drone operation
- Fire surveillance
- Weather/disaster situation monitoring

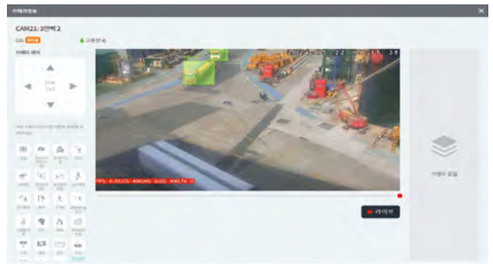


Integrated Control Center Safety Monitoring Configuration

※ Screen configuration to be adjusted flexibly depending on the situation

Hi-CAMs Operation

We are implementing the operation of the Hi-CAMs system, which recognizes real-time dangerous situations through an AI technology-based intelligent video analysis server and alerts the controller. It is being applied to about 130 CCTVs, and we are continuously improving the recognition of various situations and accuracy through machine learning of additional situation recognition/analysis.



Continuous Expansion of Safety Monitoring

With the goal of minimizing blind spots in safety monitoring, we are continuously expanding safety monitoring locations by more than 20 each year.

Classification	2023	2024	2025	2026
Additional locations	8	23	35	35
Safety monitoring locations	380	403	438	473

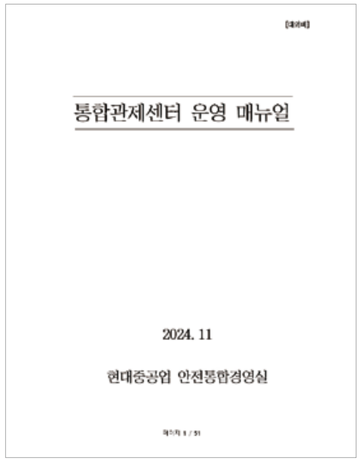
Autonomous Industrial Drone, Enterprise-wide Integrated Automatic Fire Detection System Operation

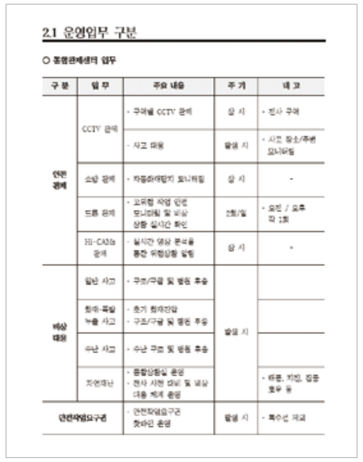
To address the limitations of existing fixed safety monitoring, we have introduced and are currently operating 5G communication-based autonomous industrial drones.

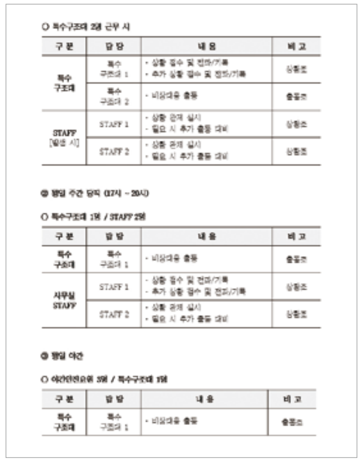
The drones patrol pre-determined times/locations and transmit real-time videos to allow real-time safety monitoring at the Integrated Control Center. In addition, we have integrated the automatic fire detection system installed in major buildings, factories, and other structures throughout the company to create a system capable of identifying fire occurrences in real time, establishing a framework that allows for situation assessment/response before emergency call reception.

Integrated Control Center Operation Manual

We have created an Integrated Control Center operation manual to minimize damage through prompt and accurate response based on situation-specific response manuals by operators at the Integrated Control Center, which operates as an enterprise-wide comprehensive situation room in emergency situations.







Emergency Response (Rescue / First Aid) Capability Building

ERT Emergency Situation Preparation Training

The Emergency Rescue Team (ERT), tasked with immediate response duties in the event of an emergency, conducts systematic training and education to respond to various emergency situations such as rescue/first aid, fire, and water disasters, and continuously strengthens expertise in related on-sites with qualification certifications for as emergency medical technician, water lifesaving, and unmanned multi-copter.

Classification	1Q	2Q	3Q	4Q	Total	Remark
Training conducted	14 times	13 times	14 times	12 times	53 times	Rescue / first aid, water disaster response, etc.



In-house Traffic Safety Management

Traffic Safety Culture Improvement for Foreign Workers

With the increase in foreign workers in-house, there has been a rapid increase in workers using two-wheeled vehicles for commuting. As such, we have conducted campaigns to guide compliance with in-house two-wheeled vehicle traffic safety rules and improve culture during sunset hours. In particular, we have helped foreign workers install front and rear lights as safety devices on bicycles and continue to improve safety awareness through safety conversations with workers who are not familiar with traffic safety culture.



In-house Speed Enforcement System Operation

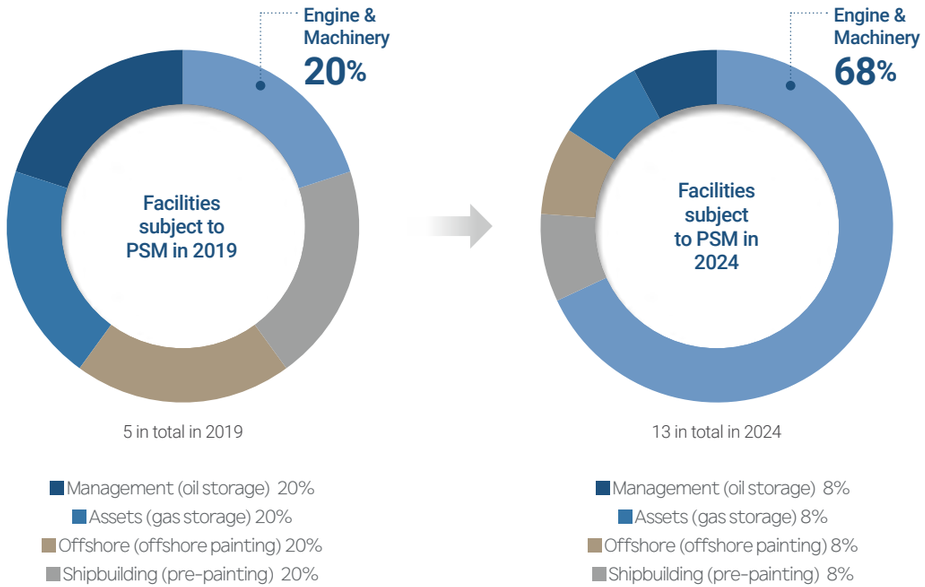
We have newly introduced and are currently operating a speed enforcement system used by the police at major speeding areas in-house. The system is expected to prevent accidents by improving traffic safety awareness regarding speeding prohibition during nighttime hours, and we are considering wider application of the system.


Improvement of PSM Management System Specialized for the Shipbuilding Industry

Improvement of the PSM Management System

Due to the increase in new facilities driven by the advancement of eco-friendly engines and construction methods and the increasing demand for strengthened safety management for "prevention of major industrial accident," such as fire, explosion, and leakage, we are improving the PSM management system to minimize related risks throughout 2024 and 2025.

In-house Facilities Subject to PSM



Target of PSM Management System Improvement

Existing

- PSM rating : M+ (M- < M+ < S < P)
  - 78.27 points in the 2021 periodic evaluation (S: 80 points)

Improvement

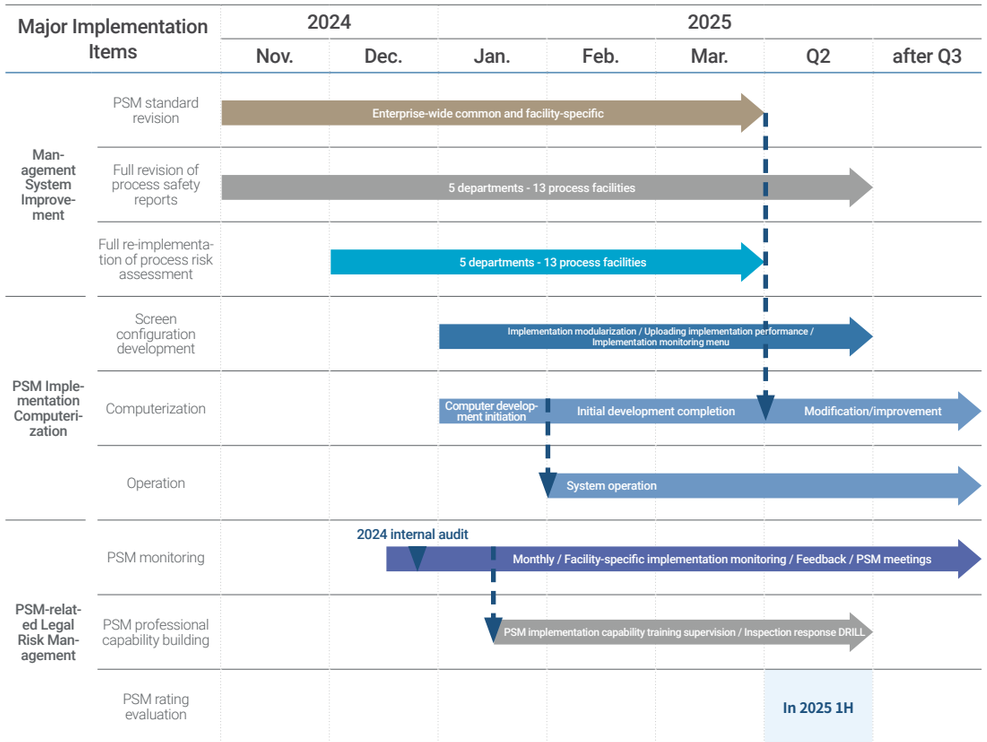
- Set a goal to increase the PSM rating by 1 level for the 2025 evaluation
  - Improvement target for 2025 rating: M+ → S grade

Direction of PSM Management System Improvement

	Current	After improvement
PSM efficiency	PSM + additional general safety works (duplication of similar safety-related tasks) PSM implementation: Work risk assessment / Permit to work (PTW) / Inspection / Contractor / Emergency drills General safety tasks: Hi-Standard / PTW / Short-term works / Emergency evacuation drills (Serious Accidents Punishment Act, Framework Act on Firefighting Services)	Established and implemented the PSM management system (integration/replacement of duplicate tasks) PSM implementation: Risk assessment / PTW / Inspection / Contractor management / Emergency measure drills (Serious Accidents Punishment Act, Framework Act on Firefighting Services, etc.)
PSM systemization	Implementation management reliant on hard copies (may lead to missing implementation procedures / misplacing performance data materials)	Computer system-based implementation management (modularization of implementation procedures by stage + computerization of performance data)
Legal risk management	Violations continued, resulting in administrative fines imposed in PSM supervisions/evaluations PSM management rating: M+ (Workplaces where the PSM system is not operating normally)	PSM supervision/evaluation monitoring and professional capability building Minimization of legal violations resulting in administrative fines/judicial measures PSM management rating improved: M+ ▶ S (reduction in supervision/guidance by relevant agencies)

Direction of PSM Management System Improvement – Established a plan to improve the PSM management system

PSM Management System Implementation Plan



In-house Fire and Explosion Accident Risk Management Implementation

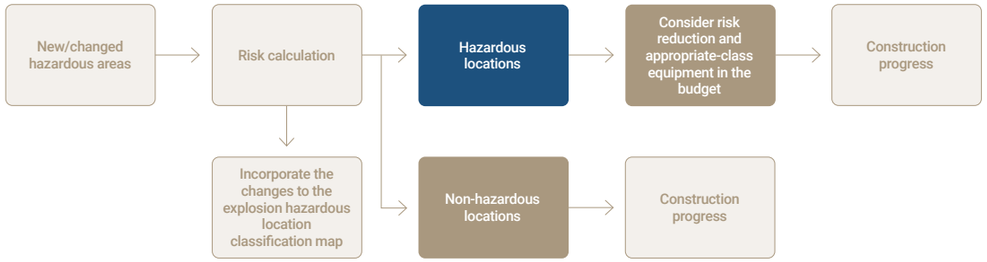
Continuous Management of In-house Explosion Hazardous Locations

When new installations or changes occur in explosion hazardous locations across the company, we operate our own in-house guidelines on the selection and use of explosion-proof electrical machinery for places handling flammable liquid vapors and gases to ensure stable operation from the investment stage.

Designation of Explosion Hazardous Locations

Business unit	All targets	Explosion hazardous location designation				Non-hazardous areas	Remarks
		Zone 1	Zone 2	Zone 1+2	Total		
Shipbuilding	495	145	46	13	204	291	
Offshore & Energy	68	12	6	3	21	47	
Engine & Machinery	67	1	66	0	67	0	
External factories	91	7	28	0	35	56	

Management Procedure for New/Changed In-house Explosion Hazardous Locations



2024 In-house Fire Brigade Fire Drill

Focus on Electric Battery Fire Preparation

With the continued occurrence of electric vehicle fires in Korea and overseas, our company has newly established in-house safety guidelines for the safe use of electric vehicles and charging stations, and is strengthening enterprise-wide emergency response capabilities by equipping fire response equipment such as suffocation fire blankets, bottom water spray nozzles, and lithium battery-specific fire extinguishers, and conducting suppression drills on their actual use. In addition, we have taken measures such as ground-level parking areas for electric vehicles at external dormitories.

Electric Vehicle Fire Phobia: What is the Truth?

The Equation of Safety and Reassurance

Electric vehicles have become an object of phobia. Despite being a major accident involving a coincidence of several accidents and misfortunes, electric vehicles were identified as the "fire demon." Concerns that electric vehicles are vulnerable to fire have also proven to be misconceptions. Compared to internal combustion engines, there was not much difference in the number of fires, and industry insiders agree that the number of fire accidents will decline significantly as technologies advance.

Some incite fear by claiming that even if electric vehicles have a low fire rate, once an accident occurs, they cause "thermal runaway" that quickly raises the temperature in the surrounding area to over 1,000 degrees.

Thermal runaway refers to a phenomenon where heat accelerates a reaction to produce higher heat, and batteries that utilize unstable states have heat generation as an important cause of fire, with thermal runaway being inevitable after a fire occurs. However, in the latest electric vehicles, fire-resistant and heat-resistant materials are applied to battery packs and even vehicle bodies to minimize thermal runaway.

"The Mercedes electric car fire accident actually resolved vague anxieties, rather than increasing the fears," said one insider from the automotive industry. Companies and public offices are stepping up to dispel electric vehicle fire phobia by specifically identifying the causes of electric vehicle fires and eradicating the misconception that they can "just" catch fire.

What connects safety and reassurance is trust. The multiplication of safety and trust leads to reassurance. In the above equation, reassurance takes a value between 0 and 1, and even if safety is 1, i.e., perfect, if trust is 0, it does not lead to reassurance. To lead to reassurance, it is necessary to create a safe state and build trust by promoting communication about risks with users (customers) and workers. Building trust requires transparent disclose of both positive and negative safety-related information, making sure that everyone, including workers, is properly informed.

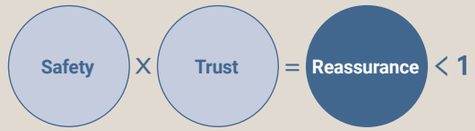
Vehicle Fire Ratio

Korean cars (total): 0.0185%
→ 175 fire accidents per 10,000 vehicles

Electric vehicles 0.0132%
→ 543,900 cumulative registrations
Fire broke out in only 72 of these vehicles

→ Less than internal combustion vehicles 0.0186%

Equation of Safety and Reassurance



4-7 Management Performance of the Health Management Section

HD HHI will lead in building a healthy workplace where workers can work with peace of mind by providing various support for medical examinations, occupational diseases, statutory personal protective equipment (PPE), work environment measurement, and chemical substance handling management.

SAFETY
HEALTH

Major Achievements of the Health Management Section in 2024

Detailed Action Plan	Implementation Methods	Major Achievements
Advancing the Health Management System	**Advancing the Hi-SEs Health Management System (Web Version)**	
	Developing the web transition of the Hi-SEs Health Management System	Defined requirements related to system functions and created a screen concept diagram
	Developing functions to prevent and control infectious diseases (including vaccination)	Defined requirements related to system functions and created a screen concept diagram
	Establishing the work-related disease statistics management system	Defined requirements related to system functions and created a screen concept diagram
	Developing internal chemical hazard assessment functions (for relevant departments)	Defined requirements related to system functions and created a screen concept diagram
	Establishing the functions of local exhaust device status management	Defined requirements related to system functions and created a screen concept diagram
	Developing health hazard assessment functions within Hi-Standard	
	Establishing an operational plan for the health hazard assessment system	Developed and reported improvement plans; health risk assessment based on the improvement plans scheduled for December 2024
	Developing a health hazard assessment system	Defined requirements related to system functions and created a screen concept diagram
	Advancing health indicator management system operations	
	Developing a health indicator management system (Hi-SEs)	Defined requirements related to system functions and created a screen concept diagram
	Establishing a personalized health record management system	Developed and reported the phase 2 health indicator management system
Strengthening chemical management	**Enhancing chemical import / handling data management**	
	Developing review functions for chemical material import/handling departments (HiPRO)	Defined the relevant requirements and currently holding meetings on system configuration
	Strengthening chemical management operability	
	Operating the chemical management system	Identified: 1,107 targets / 7,831 non-targets Assessment: 3,091 approved / 142 non-approved
	Addressing chemical handling issues on-site (skin condition issues, etc.)	Responded to issues as they arise 1. Special safety education conducted for methanol handling departments (Commissioning Department) 2. Improved and applied hard fouling paint 3. Addressed odor issues at pretreatment factories
	Conducting regular safety inspections of local exhaust systems	83 inspections completed with 100% pass rate
	Developing hazard prevention plans for ventilation facilities	100% approval rate for completed reviews As of December 2, 2024 - 6 completed / 1 in progress
Strengthening work environment management	**Strengthening workplace environment measurement operations and monitoring**	
	Regular measurements: biannual; measurements in a shortened cycle: Once in 3 months	Completed work environment measurement in 2024 1H and 2H - 72 departments in total
	Monitoring and managing hazardous factors that exceeded the exposure limits in the working environment measurements	54 out of 72 departments had hazard factors exceeding standards in 2024 (welding fumes, noise, etc.) Monitored department exceeding the standards and managed the exceedance rates
	Strengthening on-site inspection activities for work environment measurement (verification of improvement performance implementation, etc.)	Conducted on-site inspections for 49 departments including Construction Department 1
	Tracking work environment measurement results (ventilation improvement such as hull vessels)	Jet fan installation for vessels On-site follow-up observation (conducted 2 times per month) In-shop jet fan installation On-site follow-up observation (conducted 3 times per month)
	Strengthening confined space management outside of ships	
	Establishing standards for, and managing the progress of, confined space management	Completed the list and incorporated the list in the newly revised standards
	Applying and operating work programs in confined spaces	Completed the revision of the confined space standards; final review in progress (Enterprise-wide confined space management standard manual revision reported in December)
	Strengthening health and hygiene management	
	Anti-epidemic disinfection: Periodic disinfection (all year round), special disinfection (May to August), additional disinfection (occasional); hygiene inspections of meal service facilities	Completed hygiene inspections at 38 meal service facilities Periodic and special disinfections (monthly restaurants/buildings)
	Operating improved health management activities in hot/cold weather	Took measures to prevent heat illness and supplied saline glucose pills
	Managing in-house temperature measurement system automation (office automation posting)	Hi-SEs thermometer temperature input (office automatic posting)
Strengthening the health management operation system	**Improving effectiveness of operation for medical examinations**	
	Appropriate medical examination operation: standard (annually), special (once or twice a year), general (once every other year), pre-deployment medical examinations, etc.	2024 periodic medical examinations (December/February) / beneficiaries: 13,551 people (implementation rate: 96%) Achieved a 100% medical examination rate within the year (Monitoring and promotion through text messages/official documents)
	Establishing hazardous factor calculation functions for special medical examinations (linked to work environment measurement / chemical management system)	Defined requirements related to system functions and created a screen concept diagram
	Strengthening job stress management	
	Monitoring job stress assessment results and sharing assessment results with departments	Analyzed department-level evaluation results and shared with above-average departments
	Expanding job stress management programs	Implemented mind health care programs (June 24, 2024 to November 6, 2024) - Implemented mind health diagnostic tests and provided mobile meditation vouchers; 156 participants with 74% of them interested in further participation
	Operating mental health promotion projects in cooperation with external organizations	Operated Mind-Safe Bus once a month, 12 times in total; Carried out Love Life Campaign twice (once per half year)
	Strengthening follow-up management and health promotion activities	
	Improving aftercare programs (systematic management of cerebral heart disease)	• Reported the THP program improvement plan / some programs in operation - Expanded management targets (individual disease counseling targets added for abnormal lipids, diabetes) - Reinforced program operation (mandatory counseling for highest risk groups) - Strengthened preventive activities (launched new health management programs and fostered a culture of health management) - Strengthened follow-up monitoring (linked to health management platform development)

Detailed Action Plan	Implementation Methods	Major Achievements
	Expanding health promotion program operation (obesity, smoking cessation, etc.)	Smoking cessation program (38 out of 49 participants quit smoking; 77.6% success rate) Obesity management program in progress (October 7 to December 13, 83 participants)
	Reviewing subcontractors' participation in health promotion programs	Reviewed plans to advance the health management system / Completed the VOC survey on health promotion program participation / Secured medical examination infrastructure for subcontractors and encouraged their participation in health promotion programs (yoga)
	Operating an In-house Health Promotion Center	
	Operating clinics, dispensaries, and oriental medicine clinics	January-October Operational Results - Health Promotion Center: 79,446 cases / Oriental Medicine Clinic: 16,128 cases
	Establishing and operating a health measurement clinic (stress, obesity, etc.)	Health Promotion Clinic construction complete (a space for physical tests and counseling and promotion programs)
	Inspecting and improving medical facilities and first aid and rescue equipment	Completed installation of 7 AEDs, interference wave therapy devices, muscle exercise equipment, etc.
	Enhancing subcontractor healthcare support	
	Monitoring the operation and improving the usability of subcontractors' healthcare systems	Q1 usage rate: 125/216 (57.9%) Q2 usage rate: 148/215 (68.8%) Q3 usage rate: 159/212 (75.0%) * Usage rate continued to improve, surpassing 70% in 2024
	Holding a meeting with health management agencies (linked to subcontractor support)	
	Monitoring the status of subcontractors for cases requiring observation / screening and cerebrovascular diseases	Completed the monitoring of observations/findings/brain-heart evaluation results for 2023
	Monitoring subcontractors with weak health management and implementing technical guidance	Completed public health technical guidance for 1H (15 companies) Public health technical guidance scheduled for 2H (14 companies, in December)
	Strengthening management of subcontractor healthcare at-risk employees	
	Monitoring post-deployment examination and re-evaluation requests (evaluation linked)	Q1 cycle compliance rate: 64.2%, Q2 cycle compliance rate: 63.2%, Q3 cycle compliance rate: 66.7%, Q4 cycle compliance rate: working toward 70%+
	Establishing a health management plan preparation and improving monitoring practiced (system menu improvement, registration deadline management, etc.)	Registration rate 81.9% 1H (January) and 95.7% in 2H (July) / Achieved an annual average of 90% (89%)
Reinforcing activities to prevent work-related disease and illness prevention activities	**Strengthening responses to work-related disease and illness**	
	Strengthening the work-related disease and illness management system (work-related disease and illness trends, status management, response strategies, etc.)	Complied the work-related disease and illness trends and status management (statistics) for January–December 2024
	Submitting work-related disease and illness data and conducted on-site investigations (epidemiological surveys)	Submitted work-related disease and illness data (134 MusculoSkeletal Disorders, 57 pulmonary diseases, 72 other cases including cerebrovascular diseases as of November) / Conducted seven epidemiological investigations (1 for colon cancer, 1 for laryngeal cancer, 5 for COPD)
	Operating and monitoring hearing/respiratory programs (fit tests, etc.)	Carried out the hearing/respiratory program for 2024 and respiratory protector/earplug fit tests
	Strengthening MSD Prevention	
	Conducting occasional investigations on the harmful factors of MSDs	77 out of 80 surveys completed as of the end of October (96.3%), 100% completion expected within the year
	Monitoring the implementation of musculoskeletal disease outcomes	77 out of 80 surveys completed as of the end of October (96.3%), 100% completion expected within the year
	Complementing musculoskeletal disease prevention and management programs (program re-review, prevention management best practices management, etc.)	Musculoskeletal disorder prevention management program (HEMP) reviewed and reported program improvements and reorganization plans (* Further systemization of the Hi-SEs advancement program scheduled for 2025)

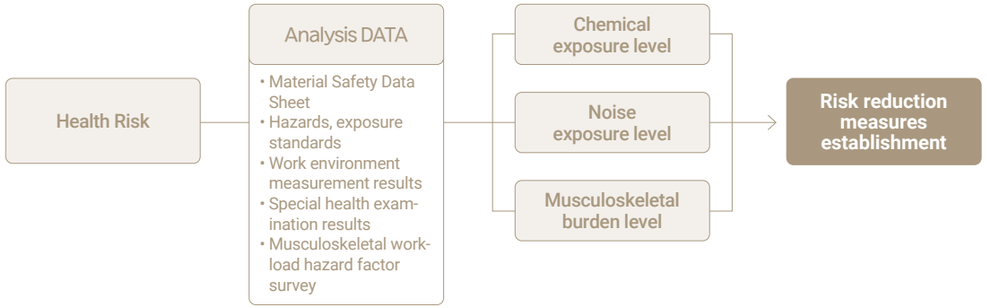
Detailed Action Plan	Implementation Methods	Major Achievements
	Improving PPEs and safety consumables operations	
	Improving the management of PPE issuance	1. New safety shoes selection and on-site testing - Selected new safety shoes to test (selected products from 2 manufacturers) - 1st on-site test completed (May 31) - 2nd on-site test in progress (June 3 to July 12) - Selected the safety shoe manufacturer (July) - Supplied the safety shoes scheduled for 2H (November 29) 2. Changed the distribution criteria for prescription safety glasses - Applied as of May 2024 - Changes: shortened the request cycle (twice a year → monthly), expanded applicable jobs, removed subcontractor entry restrictions 3. Established the safety boot distribution criteria (periodic distribution) - To be implemented by the end of Q2 2024 - Completed the distribution of safety boots (July)
	Establishing standards for each type of PPE	Established the distribution criteria for ammonia protective clothing and safety boots, followed by enterprise-wide notification and on-site distribution
	Monitoring the cost of purchasing PPEs and safety consumables	Monitored Hi-SEs inputs - Writer authority granted and input requested from non-entering departments
	Improving PPE standards management in the common resource management system	Updated safety protective equipment images (Approximately 500 codes out of 515 completed)
	Strengthening PPEs and safety consumables quality control	
	Working on improvements to the PPE/safety consumables	Reviewed equipment/auxiliary materials (32 cases in total) - 24 reviews concluded, 8 reviews in progress
	Monitoring PPEs and safety consumables' performance, quality, safety, etc.	1. 2 dust mask filter tests (SF-3100, 2100): pass 2. 2 safety harness (S-TOP) tests (fire, durability) 3. 1 internal welding apron fire test 4. Monitored secondhand PPE (safety shoes) transactions (non-scheduled)
	Providing major PPEs (safety shoes, prescription safety glasses, safety boots)	1. Periodic safety shoes distribution complete (1H/2H, 2024) (May 31, November 29) 2. Periodic prescription safety glasses distribution for 2024 - 1Q, May-December (monthly) periodic distribution completed 3. Safety boots periodic distribution complete (July 5 to July 18)

Advancement of the Health Management System

Health Risk Assessment Improvement

The current health risk assessment effectively quantifies chemical risk levels by evaluating the types of substances, hazards, and exposure levels for each process. However, the risk calculation process is complex, and it has the limitation of not considering the musculoskeletal burden level, which is one of the major management elements in the health on-site. To address these limitations, we have improved the system to comprehensively evaluate health risks by considering chemical substances, noise, musculoskeletal burden, work environment measurement results, and special health examination results. In addition, we plan to develop a computer system to easily calculate and manage risks on-site, which will be deployed in 2025 2H.

The Revised Health Risk Assessment Structure



Health Risk Assessment System Configuration (Draft)

Advancement of Health Indicator Management System Operations

We operate an established health indicator management system to systematically manage data, such as chemicals, work environment measurement results, and health examination results, and to easily monitor them. To calculate indicators, a large amount of data must be collected and statistically processed, and we are preparing to develop an indicator management system to simplify this and improve accessibility to calculated indicators. Scheduled for launch in 2025 2H, the system will automate indicator calculation and make it easier to incorporate changes in each indicator.

Health Indicator Management System Configuration (Draft)

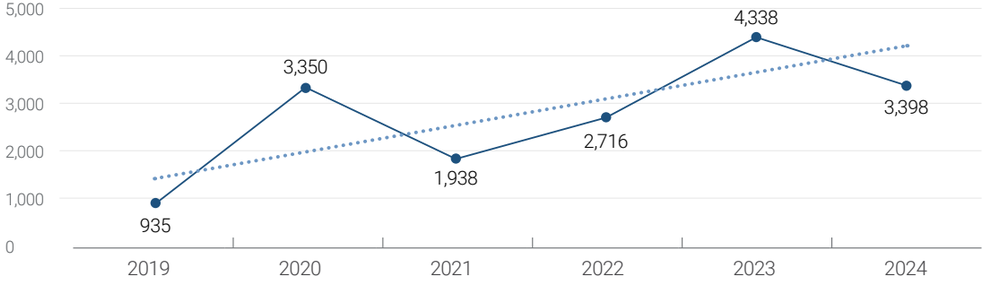
Strengthening of Chemical Management

Chemical Substance Management System

HD HHI has computerized all chemical substances brought into the company since the introduction of its chemical substance management system in 2019. In addition to simple MSDS management, the system is designed to review the appropriateness of importing and handling products at the entry stage and compile them into a database for easy access on-site.

Operational Performance of the Chemical Management System

Classification	Hazard Assessment		No. of Issues Occurred	MSDs Submitted for Imported Materials
	Approved	Not Approved		
2019	932	3	-	-
2020	3,337	13	-	-
2021	1,924	14	13	21
2022	2,466	250	22	10
2023	4,179	159	18	27
2024	3,248	150	7	19



* Chemical hazard assessment implementation over the last six years

Inhouse Chemical Handling Issue Management

HD HHI uses various types of chemicals, and chemical handling issues may arise due to the development of new processes and technologies or the adoption of stricter laws or regulations. The Health Management Section proactively identifies and responds to chemical handling-related issues across various situations.

Special Safety Education for Methanol Handling Department (Commissioning Department)

Methanol-powered vessels newly constructed by HD HHI use a propulsion method that differs from the conventional one. Methanol is not a commonly used fuel. To prepare new risks not found in existing workplaces due to the introduction of new fuels, we implemented special training for the methanol handling department (Commissioning Department).

Training Schedule	2024.3. ~ 2024.4.(2 sessions)
Training Method	On-site lectures by chemical handlers
Training Content	• Methanol exposure accidents • Hazards and risks of methanol • Proper methanol handling methods • How to respond to methanol accidents

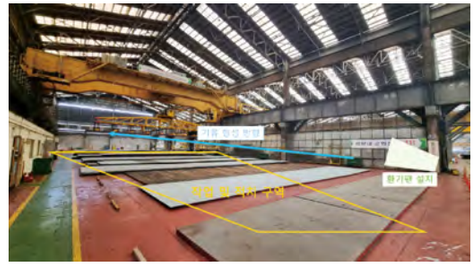
Hard Fouling Paint Improvement

Hard fouling paint, which is used to prevent corrosion of the hull during construction, has a very intense odor, unlike other paints, causing continuous difficulties for workers handling the paint. The Health Management Section, in collaboration with paint manufacturers, has improved the physical properties of hard fouling paints since last year and introduced a new product with greatly reduced odor while maintaining workability and performance. The odor has been significantly reduced compared to the existing product, making a significant contribution to resolving the difficulties faced by on-site workers.

Odor testing of improved paint

Measures to Address Pre-treatment Process Odor

Workers complained about the strong odor generated when handling certain paints in the steel plate pre-treatment process. To address the issue, we closely inspected the process, checked for potential health hazards, and comprehensively analyzed the problem. As a result, guidelines for improvement were established and delivered to the on-site, effectively resolving the issue.



Ventilation plan presented in the problem-solving guide

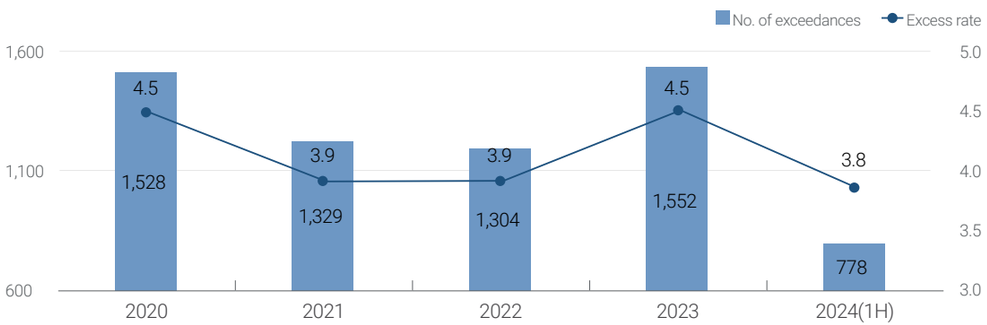
Strengthening of Work Environment Measurement Management

Strengthening of Workplace Measurement Operations and Monitoring

HD HHI conducts work environment measurements twice a year in accordance with Article 125 of the Occupational Safety and Health Act (which includes developing a measurement plan, collecting samples, and analyzing and evaluating the working environment to identify the actual conditions of the working environment).

Work Environment Measurement Operation

Categories (including subcontractors)		2023 2H			2024 1H		
Duration of measurement		'23.7.11. ~ '23.12.26.(84 days)			'24.1.15. ~ '24.6.20.(96 days)		
Target departments		65 departments			72 departments		
No. of measurements		15,353			20,036		
No. of people measured		2,356			2,909		
Hazard factors	Evaluation	Below standard (measurements)	Exceeding (measurements)	Excess rate (%)	Below standard (measurements)	Exceeding (measurements)	Excess rate (%)
	Noise	1,705	755	30.69	2,431	644	30.69
	Welding fume	618	33	5.07	651	43	5.07
	Dust (metals)	7,735	7	0.09	9,825	26	0.09
	Organic compounds	2,326	54	2.27	2,782	65	2.27
	Others	2,119	1	0.05	3,569	-	0.05
	Total	850	5.54	5.54	19,258	778	3.88



* Monitoring hazards above exposure limits in workplace measurements

Strengthening of On-site Management Activities for Work Environment Measurement

We strengthened on-site management activities during work environment measurements for departments where hazardous factors exceeded standards.

Ventilation using exhaust and intake systems with automated noise reduction equipment

Investment in ventilation facilities

Strengthening of Health and Hygiene Management

Disease Control, Disinfection, and Hygiene Inspections of Meal Service Facilities

As a preventive measure for building/workplace hygiene and worker management, we conduct hygiene inspections on a regular basis and disinfect food service facilities every summer, and thoroughly manage the hygiene condition of all facilities including building blocks and meal service facilities.

Hygiene Inspection of Meal Service Facilities	
Inspection targets	39 locations (36 cafeterias, 3 external boxed meal companies)
Inspection period	May 23 - July 4, 2024 (9 days)
Scope of inspection	Examining the bacterial growth rate of samples collected from tableware, cutting boards, knives, and dishcloths




In-house Disease Control (Periodic/Special Disease Control)		
Disease control targets	69 buildings, 27 restaurants, other drainage (including Naengcheon Plant)	
Disinfection period	Periodic disease control	buildings: 1 time/2 months, cafeterias: 1 time/month
	Special disease control	Special disease control (buildings including cafeterias and drains: additional monthly control from May to October)





Earplug Fit Test and Respirator Fit Test

Respirator fit tests and ear plug fit tests were conducted for high risk individuals among people requiring medical observation (C1) for hearing issues and respiratory diseases identified in health examination results. The tests helped workers make sure that they wear protective equipment properly, provided guidance on the correct way to wear them, and helped them recognize the importance of protective equipment.


Respirator fit test


Ear plug fit test

Heat Illness Prevention During Summer

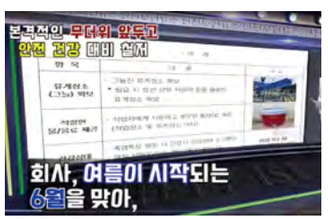
To prevent heat illness among workers working outdoors during summer, we extend break times and provide rest facilities, along with supplies to prevent heat illness during high summer.

Classification	Details
High summer events	Provides cool, clean water/beverages, etc.
Additional rest facilities	Container rest zones and other rest facilities, and sun shields above vessels
Extended break times	Hot days: 28°C; extended by 20 minutes / High summer: extended by 30 minutes (July 10 - August 31)
Summer-related supplies	Cooling equipment such as ice makers and spot coolers, salt glucose, etc. High summer supplies
Training programs	Heat illness prevention training through Hyundai News and in-house CATV, distribution of heat illness prevention rules for foreign workers in multiple languages


Multilingual heat illness prevention rules


Ice makers and portable drinking water


High summer events



CATV video training

Ventilation Facility Hazard Prevention Plan Review

In accordance with Article 42 of the Occupational Safety and Health Act, when installing new ventilation devices, facilities subject to hazard prevention plans are reviewed by KOSHA, and we maintain a healthy working environment by continuously managing them to meet statutory standards.

2024 Hazard Prevention Plan Review

No. of reviews	8 reviews
Types of facilities reviewed	• Insulation process general ventilation devices • Pre-treatment process ventilation devices • Cutting equipment • Sand removal devices • Painting booth ventilation devices

Ventilation Facility Safety Inspection

In accordance with Article 93 of the Occupational Safety and Health Act, we carry out periodic safety inspections on ventilation facilities installed in the company.

2024 Ventilation Device Safety Inspection

No. of facilities inspected	74 units (all passed)
Inspector	Ulsan Branch, Korea Industrial Safety Association
Inspection period	October 31, 2024 - November 11, 2024

Strengthening of Health Management Operation System

Effectiveness Improvement of Medical Examinations

We offer standard medical examinations to periodically check employees' health, and special medical examinations are provided for employees engaged in specific tasks exposed to hazard factors such as noise, harmful light, metals, and organic compounds. In addition, employees can benefit from our comprehensive medical examinations, along with job-specific customized prevention and management programs.

Medical Examinations in 2024

Classification	Standard	Special Examination		General Examination	Others
		2024 1H	2024 2H		
Schedule	2024.3.20. ~ 2024.12.31.				Pre-deployment examination / Overseas examination / Employment examination / Follow-up examination
Target	White-collar	Production workers	Excessive exposure to measurement factors	Age 40+, 1 year of service ※ Additional optional tests (once every 6 years)	
Examination cycle	once per year	once per year	-	once every 2 years	
No. of employees examined	In progress	In progress	In progress	In progress	

* Optional examinations: ① Colonoscopy ② Low-dose lung CT/Cyfra 21-1 ③ Ultrasound for prostate/thyroid ④ Ultrasound for breast/thyroid ⑤ OCT angiography / thyroid ultrasound

Strengthening of Post-management System for Medical Examination and Health Promotion Activities

Smoking Cessation Clinic

To promote employee health by motivating them to stop smoking, we opened a "Smoking Cessation Clinic" in cooperation with Dong-gu Community Health Center in 2007. We run a professional counseling program to ensure successful smoking cessation for employees. In 2024, a total of 49 people participated in the counseling program, of which 38 successfully quit smoking. We help them stay away from smoking through smoking abstinence maintenance evaluation. In addition, we donated the smoking cessation fund of KRW 1.1 million created at the Smoking Cessation Clinic from April to October to the Hyundai 1% Nanum Foundation as a form of social contribution.

Classification	No. of Participants	No. of Successful Participants	Success Rate
2024	49	38	78%
2023	97	83	86%
2022	Not implemented due to COVID-19		
2021			


Obesity Control Program

As part of employee health promotion and THP program improvement, we have been maintaining an obesity management program since 2017. We also manage an obesity fund for obese employees identified through each year's examination results on a voluntary basis, with body composition analysis and health counseling to support customized health management. In addition, we expanded the scope of health management to include various activity programs such as low-sugar diet provision, healthy food cooking classes, and in-house exercise with experts. In 2024, a total of 83 employees participated.


Health Promotion Center

Operation and management of in-plant hospital, physical and rehabilitation therapy center, and oriental medicine clinic

Our Health Promotion Center protects and promotes the health of employees. We help employees remain healthy through various medical services such as health counseling, medical treatment, drug therapy, physical and rehabilitation therapy, and oriental medicine treatment. In 2024, a total of 118,288 people visited the center.

Health Promotion Center Performance

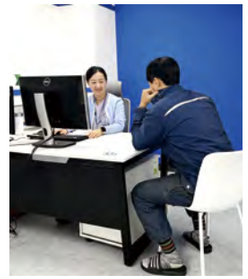
Classification	Ratio compared to previous year		2024		2023	
	Total	Individual	Total sum	Individual	Total sum	Individual
In-house hospital	110%	112%	118,288	78,223	107,076	69,803
Physical/Rehabilitation		133%		22,431		16,820
Oriental Medicine Clinic		86%		17,634		20,453

Health Promotion Clinic Establishment and Operation

The Health Promotion Center provides employees with not only medical services but also various health management programs such as obesity management, smoking cessation, and follow-up management based on health examination results. To operate these activities more smoothly, we set up a health promotion clinic within the Health Promotion Center. The health promotion clinic is equipped with professional measuring equipment for height, weight, obesity, blood pressure, glycated hemoglobin, stress, etc., and a consultation area to carry out health management programs in a more comfortable and professional environment.

Examination and Consultation Items

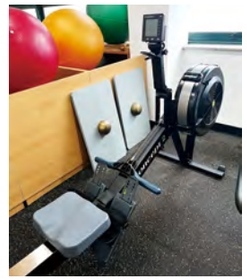
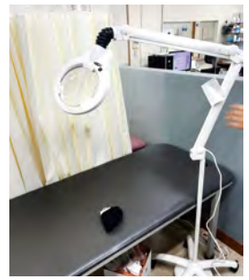
Body Composition	Height & Weight	Blood Pressure	Diabetes
Stress & Brain	Dyslipidemia	Obesity & Quitting Smoking	Ear Fit & Mask Fit

Health Promotion Clinic

Medical Facilities and Emergency Equipment Inspection and Improvement

To respond to on-site emergencies and improve the level of medical services, we inspect and improve ambulances, automated external defibrillators (AEDs), and medical devices and equipment on a regular basis. In 2024, the medical environment was improved by replacing and newly installing automated external defibrillators, medical beds, medical magnifiers, physical therapy equipment, and rehabilitation exercise equipment.

Strengthening of Job Stress Management

To minimize the negative effects of job stress and maintain a healthy work environment for employees, we monitor job stress levels on an annual basis and operate various management programs based on the results.

Training

Job stress prevention and management training (safety and health training)

Monitoring

Job stress level assessment and monitoring (once a year)

Participatory Programs

- Mind-Safe Bus
- Love Life Campaign
- Healing programs
- Mental health care programs

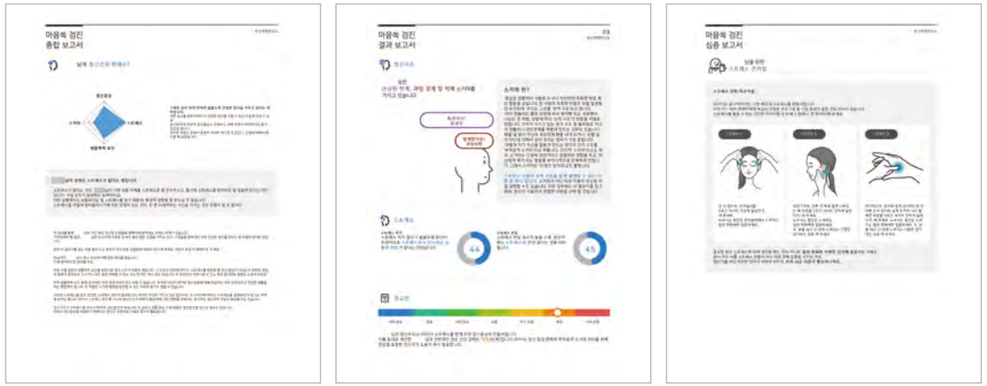
Measurement/ Counseling

Stress measurement/ counseling
Mind Garden counseling

Mental Health Care Program

We offer a mental health care program to alleviate the negative effects of stress (tension, anxiety, burnout, etc.) and support emotional recovery. Participating employees were provided with online mental health screening services and a mindfulness meditation app (Breeseed Meditation) for up to 4 months to examine their mental health and experience mental stability and rest. In addition, external expert lectures on mindfulness meditation provided opportunities to learn and practice useful stress management methods.

Classification		Mental Health Care Program		External expert special lectures
		Mental health diagnosis	Breeseed meditation	
Content		2 MHSQ mental health screening vouchers	2 2-month mobile meditation app vouchers	lecture by a mindfulness meditation expert (90 minutes)
No. of participants	1st session	137 people	122 people	37 people
	2nd session	14 people	32 people	



Online mental health screening service (MHSQ) result sheet

Special lecture by a mindfulness meditation external expert

Mental Health Welfare Center Program

In addition to the in-house job stress management programs, we implement mental health promotion activities in partnership with local mental health and welfare centers. The Mind-Safe Bus is dispatched monthly to provide stress measurement, mental health screening and counseling services, along with booths offering activities such as mental health quizzes and games through the annual Love Life Campaign to raise awareness and recognition of mental health.

Mind-Safe Bus, Love Life Campaign

Strengthening of Subcontractors' Health Management

As many subcontractor employees work at HD HHI, the health management of subcontractors is crucial in creating a healthy work environment. The Health Management Section continuously makes various efforts to improve the level of health management for subcontractors.

Meetings with Health Management Service Providers

We meet with the Ulsan University Hospital Occupational and Environmental Health Center and the Ulsan Industrial Health Center of the Korea Industrial Health Association in annual meetings to strengthen support for subcontractor health management.


Technical Guidance to Subcontractors with Substandard Health Management

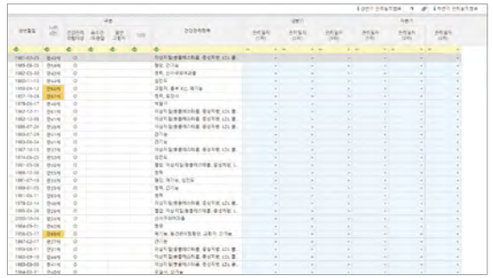
We strive to strengthen subcontractors' health management by visiting vulnerable subcontractors twice a year to check potential health-related vulnerabilities in advance and provide guidance on seasonal focus items. In particular, in 2024, we adopted more detailed quantitative inspection criteria. We also strengthened our technical guidance to ensure the deployment of more practical health management through worksite visits.

- 2024 1H: 15 subcontractors without health management agency among subcontractors with less than 50 employees / Average 89.1 points
- 2024 2H: 9 new subcontractors with less than 50 employees and subcontractors with insufficient technical guidance in 1H / Average 87.2 points
- Strengthened on-site guidance (chemicals, heavy objects handling, protective equipment, rest facilities, etc.)


Management for Persons with Health Care Risks

To strengthen the management of subcontractor workers with health-related risks, we evaluate safety management levels every quarter to monitor the percentage of persons with health-related risks and compliance with re-evaluation cycles. In addition, we follow it up by requiring subcontractors to prepare and implement health management plans every six months through the integrated HSE management computerized system, and help the subcontractors systematically manage examination and follow-up performance through their own health management system.

- Health management plan registration rate (%): 81.9% in 1H / 95.7% in 2H
- Subcontractor self-health management system usage rate (%): 57.9% in Q1 / 68.8% in Q2 / 75.0% in Q3 / 74.5% in Q4

Strengthening of Activities to Prevent Work-Related Disease and Illness

Strengthening of Activities to Prevent MSDs

Hazard Survey of Works Causing Musculoskeletal Burden in 2024

In accordance with Article 657 of the Industrial Safety and Health Standards Regulations, in case of work-related musculoskeletal disorders, we immediately conduct ad-hoc hazard factor surveys through musculoskeletal disorder prevention and management promotion officers at the relevant departments and carry out improvement activities as needed.

- No. of ad-hoc hazard factor surveys conducted (January-September): 76
- Major improvement cases in 2024

Department	Work Title	Description
Unit Production Department	Semi-automatic welding (CO_2)	Reduced knee and back strain from squatting by adopting mobile jigs (chairs) for supporter welding
Block Assembly Department 3	Installation of outer plate mid-frame lugs	Reduced excessive force use using lug fitting devices
Panel Assembly Department 1	Automatic HEBE SAW welding	Reduced knee and back strain from squatting by adopting auxiliary chairs for welding
Outfitting Production Department	Chock liner milling	Used 4-inch grinders to remove cut slags, reducing the force required for filing tool work
Construction Department 3	Support work	Reduced arm, shoulder, and back strain from iron hammer work by utilizing hydraulic jacks for support securing
Processing and Sub-assembly Department 2	Small assembly plate joining	Reduced arm and shoulder strain from iron hammer work by adopting magnets for plate fitting
Painting Department 2	Outer plate surface preparation (grinding)	Reduced neck, shoulder, and arm strain from looking up posture by utilizing automated equipment for upper surface grinding

Prevention and Control of Work-Related Disease and Illnesses

When workers apply for industrial accident compensation for work-related diseases and illnesses, we carry out on-site investigations (epidemiological investigations) as needed to verify the causal relationship between the disease and the relevant work. The Health Management Section coordinates with the Korea Workers' Compensation & Welfare Service and relevant departments as needed, and performs related tasks such as reviewing the application details in advance, securing survey locations, and responding on-site to facilitate smooth on-site investigations.

- Epidemiological investigations conducted in 2024: 7 investigations (1 for colon cancer, 1 for laryngeal cancer, 5 for chronic obstructive pulmonary disease)
- Work-related disease and illness data submitted in 2024: 134 for musculoskeletal disorders, 57 for pulmonary diseases, 72 for other cases including cerebrovascular diseases

Improvement of PPEs and Safety Consumables Operations

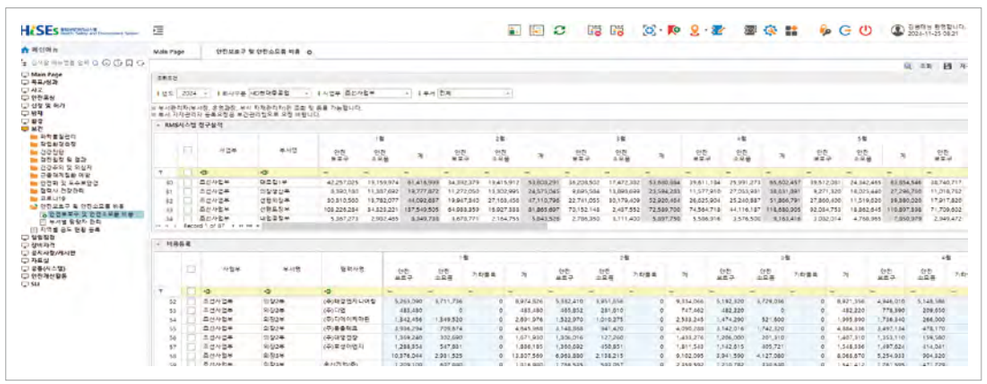
Improvement of PPE Distribution Management

In line with the mandatory wearing of safety glasses in the Shipbuilding Business Unit, HD HHI has significantly relaxed the standards for providing prescription safety glasses to new employees and production workers (including subcontractors), and has been processing monthly prescription safety glasses applications and distribution since May 2024. In addition, we established new safety boots distribution standards for workers assigned to outdoor wet work jobs (including subcontractors), and periodic distribution was completed in 2024 1H.

Distribution Criteria		Existing	Changed	Remarks
Prescription glasses	Requested quantity	1 pair/year	Same as the left	
	Request cycle	Twice per year (1H and 2H)	once a month (12 times a year)	monthly vision measurement
	Target jobs	Welding, fitting, machining, marking and cutting, piping, painting	All direct production/support jobs	
	Employee criteria	At least 6 months of employment (subcontractors)	abolished	
Safety boots (newly established)	Requested quantity	1 pair/2 years	1 pair/2 years	
	Request cycle	Non-scheduled distribution	Once a year (May-June)	
	Target jobs	Some wet work jobs	Wet work jobs (outdoor jobs only)	

Monitoring the Cost of Purchasing PPEs and Safety Consumables

We monitor the cost performance of PPE and safety consumables for each department (including subcontractors) on a monthly basis.



Strengthening of PPEs and Safety Consumables Quality Control

Improvement of PPE Distribution Management

We continuously perform activities to prevent worker health hazards and safety accidents by improving the safety of PPE (including safety consumables) provided to workers. In 2024, the performance improvement and review of statutory protective equipment and safety consumables were completed.

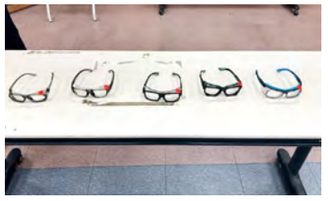
Item Name	Photo	Major Improvements
Safety footwear		• Safety shoes newly registered (8-inch, 6-inch, 4-inch, etc.)
Shoulder bands		• Work posture correction (improvement) for painting (surface preparation) work, etc., to prevent musculoskeletal disorders
Magnetic crane remote control belt		• Shock absorption for shoulder areas
Type 3 protective clothing		• Ammonia protective clothing (for emergency evacuation)
Chemical-resistant gloves		• Chemical-resistant gloves for ammonia
Welding gloves (3-finger)		• Improved thickness, material, and finishing (seams) product
Welding face shield (band type)		• Improved welding face shield fixation method to band type
Fall prevention device (rope grabs)		• Lightweight, prevents slipping down

Provision of Major PPEs (Safety Shoes, Safety Boots, Prescription Safety Glasses)

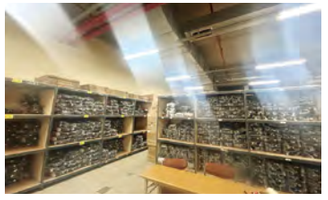
HD HHI regularly provides appropriate PPEs (safety shoes, safety boots, prescription safety glasses) to workers (including subcontractors) related to production work every year, and also provides them to new employees at all times. In addition, we will continue to improve quality and distribution standards to ensure the safety of on-site workers and improve convenience.

Categories	Target	Distribution standard	Distribution date	Distribution quantity
Safety shoes	Production technicians (including subcontractors)	Twice a year/person	May and November	52,767
Prescription safety glasses		Once per year/person	Monthly	12,194
Safety boots	Wet work jobs (outdoor)	Once every 2 years/person	June	5,597





Vision measurement and frame selection for prescription safety glasses

Safety boots and safety shoes inventory

Innovation and Safety of SpaceX

The Secret to SpaceX's Success: Securing Productivity Based on “Safety”

On October 13, 2024, Elon Musk's SpaceX showed the true meaning of “cutting edge” in technology by landing Super Heavy, the first-stage rocket booster of Starship*, which the company is developing for Mars exploration, directly on the launch pad during its fifth launch.

Optimal control of the booster according to the launch vehicle's orbit and real-time position would have been impossible without mathematical optimization. SpaceX has already landed rocket boosters on land or at sea since 2015 and has innovated the field by reusing the same booster more than 20 times. This time, they successfully landed the rocket directly on the launch pad. With this success, by reusing the booster up to the target level, launch costs** can be reduced by up to 80 times compared to the existing ones, and the preparation time for re-launch can be dramatically shortened from one month to one hour.

SpaceX already dominates about 64% of the global launch vehicle market as of 2023 1H, partially owing to its overwhelming orbital launch success rate. Arguably, the thorough safety system operation has greatly contributed to opening the door to the commercialization of the rocket launch market.

As space flight is one of the most sensitive and complex areas in terms of safety, SpaceX can only secure an accident rate close to zero (“0”) with the safety assurance system required during the launch process regulated by the Federal Aviation Administration (FAA) and sophisticated safety control protocols to prepare for contingencies during flight/on the ground.

SpaceX experienced several setbacks in the early stages of its business and was in danger of closing down, but it has achieved commercialization through technological innovation based on a new safety system, numerous tests, and safety verifications in a field that no one had dared to enter. It is expected to consolidate its status as a synonym for success.

* Starship: SpaceX's super-large rocket created to transport crew members and cargo to the Earth orbit, the Moon, and Mars
** As of last year, each launch cost about KRW 219.3 billion / When reusing the booster, it is expected to be around KRW 2.7-4.1 billion.

4-8. Management Performance of Business Units

To proactively prevent safety accidents, business units conduct various safety activities to establish a production-led safety management system. In the event of a safety accident, effective countermeasures are established, and training is conducted. The established countermeasures are also disseminated to the field to prevent similar accidents from recurring.

SAFETY
HEALTH

SHIPBUILDING BUSINESS UNIT

The Shipbuilding Business Unit, which has the world's best shipbuilding capabilities, builds various vessels, from general merchant ships to special ships of the highest quality. After its establishment in 1972, Hyundai Heavy Industries achieved continuous growth, ranking first in shipbuilding volume just 10 years after its founding. The Shipbuilding Business Unit wrote a great history with the world's first achievement of 100 million GT of ship construction in 2012 and the world's first construction of 2,000 ships in 2015. Currently, it is on the verge of setting a new record in the shipbuilding on-site with 1,000 days without a fatality accident.

Safety Management Achievements of the Shipbuilding Business Unit in 2024

In 2024, the Shipbuilding Business Unit conducted various safety activities centered on strengthening the operability of what was promised and advanced the system by upgrading the effectiveness of safety systems to achieve “1,000 days without a fatality accident.” As a result, this year has seen 0 fatality accidents, 31 industrial accidents, and an accident rate of 0.131, which represents a 29.6% decrease compared to the management standard.
In addition, we are making continuous efforts to introduce/lead global standards and strengthen internal and external safety communications with the goal of “Above the Global Standard.”
The Shipbuilding Business Unit will focus on ensuring that what we promised is being properly implemented in 2025, and will take one step further toward becoming a company where safety is its brand.

Compared to the management standard
-29.6%

Categories	2023 (shipbuilding & offshore sector)	2024
Fatality accidents	0	0
Accidents (work-related)	46	31
Accident rate	0.187	0.131
Frequency rate*	0.91	0.629

* Based on 1 million working hours

Major Achievements of the Shipbuilding Safety Department in 2024

Detailed Action Plan	Implementation Methods	Major Achievements
Expanding 'My Commitment to Safety'	**Identifying and focusing on vulnerability risk types by tier**	
	STEP 1: Eliminating vulnerability risks by organization	1. Safety Management Meeting: Completed selection of vulnerability risk types for each officer in charge and establishment of eradication strategies Reviewed eradication activity outcomes of each officer in charge and improved on strategies (see meeting minutes and materials) 2. Unsafe Case Study Workshop: Established and implemented eradication strategies for unsafe cases at the department head level (see meeting minutes) 3. My Commitment to Safety: Established plans (drafts) and manuals; Internal programs at each safety team suspended due to the need for improvement (improvement scheduled for the next year)
	STEP 2: Eliminating vulnerability risks by individual	1.Used the Securing Safety Authority (SSA) through on-site risk assessment when checking a work order 2. Has not developed a pledge preparation menu for individuals
Complementing and strengthening enterprise-wide fluctuation risk management	**Ensuring proactive safety management of fluctuation risk**	
	Strengthening operability of enterprise safety planning (ESP)-based risk assessment	Incorporated in the first Hi-SEs advancement; a new 20-point item added for risk assessment - Ad-hoc risk assessment: -5 points in case of a safety accident - On-site risk assessment (previous day): points deducted based on ratio - SSA / safety reporting: +0.3 points/case
	Improving the safety competence of foreigners through multilingual teaching materials	1. Added foreign language versions to mobile safety work orders: 3 languages (incorporated in M-OCEAN) - Traditional Chinese / Simplified Chinese / Hindi 2. Added mobile safety work order versions in languages supported by M-OCEAN - Increased 12 languages to 27 languages
	Providing incentives to activate mobile safety work orders	Linked mobile safety work order verification and on-site risk assessment functions - Currently, around 15,000 people are earning points
Unifying the high risk work safety management system	**Ensuring all high risk works are inspected without omission**	
	Redesignating high risk works to prevent fatality accidents and unifying PTWs	1. Finalized PTWs and checklists by discipline and applied to the system 2. Developed Hi-SEs Web; PTW application/registration in progress 3. Reviewed and added/removed PTW items through continuous collaboration with the relevant departments
	Developing a triple safety management computerized system	Developed the Hi-SEs mobile high risk work inspection menu and conducted inspections
Upgrading the risk assessment system	**Establishing risk reduction measures and using work orders**	
	Strengthening periodic risk assessments	1. Developed risk assessment level evaluation function (mid-November) 2. Developed department-specific risk assessment dashboards: Improved management through overall status
	Developed ad-hoc/on-site risk assessment systems	1. On-site risk assessment: Conducted when checking individual instructions within mobile safety work orders 2. Ad-hoc risk assessment: Developed and applied an assessment menu within Hi–SEs - Hi-Standard
Preparing a rational operation plan for the safety permit / reporting system	**Reviewing the operability of the in-house safety system and preparing a rational operation plan**	
	Strengthening PTW concurrent work (painting / fire welding devices) filtering / alarm functions	Built the PTW concurrent (painting/fire) work filtering function; update in progress - Applied the painting/fire concurrent work filtering logic - Development in progress for additional alarm functions (email, pop-up window, etc.) for on-site and safety department awareness
	Improving the POB System	Improved the Hi-SEs Web POB System - In-house: Linked to actual personnel in mobile safety work orders and eliminated phantom numbers - External: Registered makers and short-term work personnel in POB using QR
Adopting and leading the global standard	**Analyzing/incorporating international safety regulations**	
	Analyzing gaps to supplement standards and identify needs	1. Analyzed and added required items for company HSE standards: 6 new standards established and currently under review 2. Updated the SSHE Plan for LPG projects 3. Reviewed items that are inconsistent with company standards such as IOGP in new shipbuilding bid contracts and provided feedback to sales departments
	Managing and following global accident indicators (LTIR, TRIR)	1. Established HSE statistical indicator standards for sales: improved MTC, RWC, nearmiss standards 2. Managed sales statistics using Frontier
	Ensuring mandatory wearing of safety glasses	1. No eye-related accidents caused by failure to wear safety glasses 2. Analysis of eye-related accidents showed that they took place while the victims were wearing safety glasses
Strengthening internal and external safety communication	**Expanding communication channels**	
	Publishing Safety Frontier	Published monthly to all owners & classes: November issue published
	Holding the HSE Forum	Not implemented
Improving the safety level of in-house and external employees	**Expanding support for safety technology guidance for subcontractors**	
	Operating training programs to build safety capabilities of subcontractor safety managers (Safe Clover)	1. Set up training courses following the improvement of Safe Clover operation (February): Conducted advanced training and introductory training for new appointees 2. Operated a mentoring program for subcontractor safety managers (2-week activity)
	Expanding audits of external subcontractors (in collaboration with the Safety Inspection Section)	1. NYK Project: 13/13 completed 2. Maersk Project: 20/20 completed 3. Safety Inspection Section support rate 100%: Completed joint action for external subcontractors with poor performance (2/2)
Cultivating specialists to respond to shipowners and foreigners	**Effectively responding to shipowners and increasing customer confidence**	
	Securing expertise in dealing with shipowners by training specialized staff	1. Recruited one professional (with prior experience) to engage with shipowners in 2H and assigned duties 2. Promotion to peer companies and shipowners in progress
	Helping professional staff build their work capabilities	1. Meeting in progress on improvement of confined space standards among three shipbuilding companies, along with standards revisions 2. Currently implementing safety benchmarking programs among peer companies - Conducted benchmarking for cranes and heavy equipment safety among three major shipbuilding companies (June 28 to July 17)

Expansion of “My Commitment to Safety”

Identification and Focusing on Vulnerability Risk Types by Tier

Elimination of Organization-Level Vulnerability Risks (Department/Factory/Vessel)

To eliminate recurring unsafe practices, the Shipbuilding Business Unit is implementing customized strategies against vulnerable risks at different levels.

Safety Management Meetings

Led by the officers in charge, we hold meetings to analyze data on accidents, rule violations, etc. for each sector to identify vulnerable risk types, and eradication strategies are established and implemented. Based on the activities conducted over the following three months, we review the results to select the next highest risk type or improve on the existing eradication strategies to continuously manage different types of vulnerable risks.

Unsafe Case Study Workshop

To improve recurring high risk unsafe practices and chronic issues identified every week, we operate a weekly unsafe case study workshop to identify organizational vulnerabilities and develop prevention measures with active interest from department heads. Then, we communicate the results to workers to improve site safety.

Elimination of Individual-Level Vulnerability Risks

Before starting work, workers access on-site risk assessment content pre-entered by supervisors through TBM activities via mobile safety work orders and listen to the supervisor's safety instructions. After TBM, workers move to the work location and conduct their own risk assessment of the work content and location through the on-site risk assessment menu in the mobile safety work orders. If they discover risk factors, they immediately use the Securing Safety Authority (SSA) to ensure their own safety.

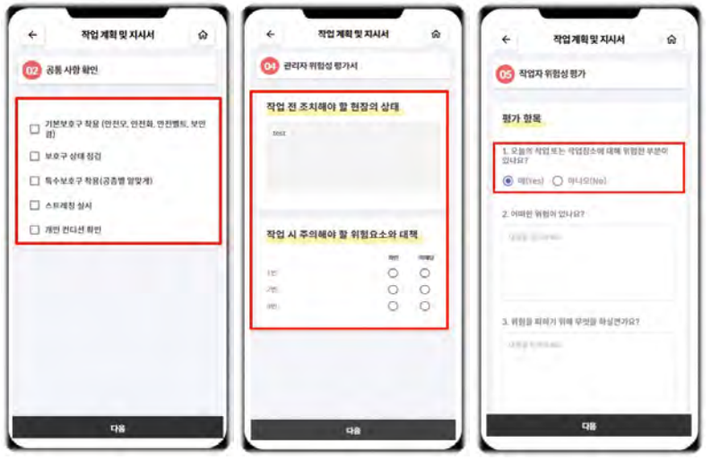
Manager/supervisor pre-risk assessment

Writing pre-risk assessment in work order

TBM activities – notifying pre-risk assessment

Worker on-site risk assessment

Worker on-site risk assessment



On-site risk assessment menu screen

Complementation and Strengthening of Enterprise-Wide Fluctuation Risk Management

Proactive Safety Management of Fluctuation Risks

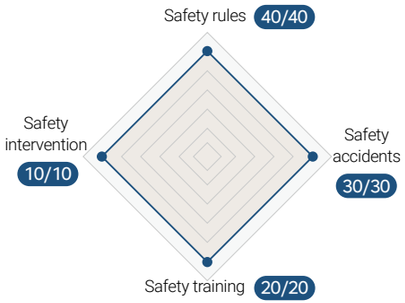
Strengthening of Operability of Enterprise Safety Planning (ESP)-based Risk Assessments

As the importance of risk assessment has increased in accordance with the government's fatality accident reduction roadmap, the safety leadership index (SLI) system has been partially changed to strengthen the operability of risk assessment in the relevant departments. In addition, to encourage management of vulnerable items, we select vulnerable items by combining potential accident type data for rule violations, safety accidents, and safety inspections (unsafe cases registered by safety supervisors), and guide the relevant departments to focus on checking and managing these items in their safety inspections for the following month.

Existing

4 items (points vary)

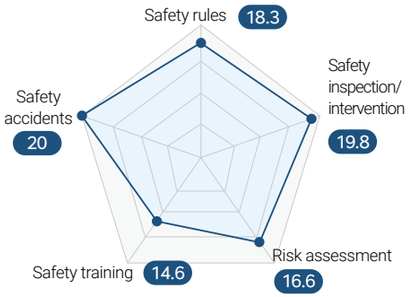
- Safety accidents 30 points
- Safety rules 40 points
- Safety intervention 10 points
- Safety training 20 points



Changed

5 items (same points)

- Safety accidents 20 points
- Safety inspection/ intervention 20 points improved (improved)
- Safety rules 20 points
- Risk assessment 20 points (new)
- Safety training 20 points



SLI item: Risk assessment [20 points / new item]

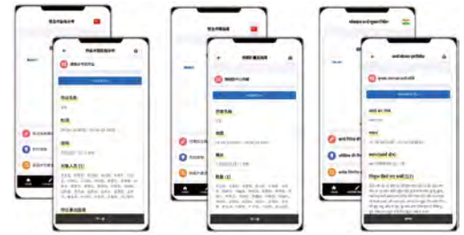
Categories	Description	
Detailed indicators	Ad-hoc risk assessment (safety accident): **-5 points**/case	10 points
	On-site risk assessment (previous day): **points deducted based on ratio**	10 points
	SSA/safety reporting: **+0.3 points**/case	(5 points)

Safety check rate*	Deduction
90% to 100%	0 points
80% to 90%	-1 points
70% to 80%	-2 points
60% to 70%	-4 points
50% to 60%	-7 points
50% or less	-10 points

* Safety check rate (Mobile safety work orders) Safety check (cases) ÷ work order assignments (cases) X 100(%)

Improvement of the Safety Competence of Foreigners Through Multilingual Teaching Materials

To help workers of various nationalities safely perform their jobs in the field, the mobile safety work order application has been migrated to the company's new platform, M-OCEAN, and the supported languages have been expanded to include 27 foreign languages.



Chinese (Simplified) | Chinese (Traditional) | Hindi

Provision of Incentives to Activate Mobile Safety Work Orders

We linked the mobile safety work order system to the new safety point system, HD Safe Pay, allowing direct workers and subcontractor workers to earn points and transfer them to KakaoPay when checking work orders and performing on-site risk assessments. Currently, about 18,000 workers are earning points through mobile safety work orders.

Content ① Safety work orders

Click "Start Work" on mobile safety work orders!

- Check work orders on mobile
- Cannot earn points if items are missing in work orders
- Earn 50 points per day/person
- Up to 1,000 points per month/person

Content ② On-site risk assessment

Click "Y/N" for Question 1 in risk assessment!

- Select "Yes or No" and conduct risk assessment
- If answered "Yes," Questions 2-4 will OPEN!
- If answered "No," 50 points will be earned

Answer Questions 2-4 and click in risk assessment!

- Upon answering Q2-4, earn additional 50 points
- Up to 100 points per day/person for risk assessment
- Up to 2,000 points per month/person

Unification of the High Risk Work Safety Management System

Inspection of All High Risk Works Without Omission

Redesignating high risk works to prevent fatality accidents and unifying PTWs

Previously, fatality accident prevention measures and PTW-requiring works were managed separately. We have now unified the system to redefine works requiring PTWs. In addition, we restructured PTW authority between production and safety to strengthen self-regulated safety in production.

STEP. 1

Fatality accident prevention measures
- Reselection of high risk work (Act. unit)
- Exclusion of duplicative and unnecessary items

STEP. 2

PTW
- Reselection of works requiring PTWs
- Unification of PTW and department-specific high risk works
- Redefinition of safety-production PTW authority (strengthening production autonomous safety)

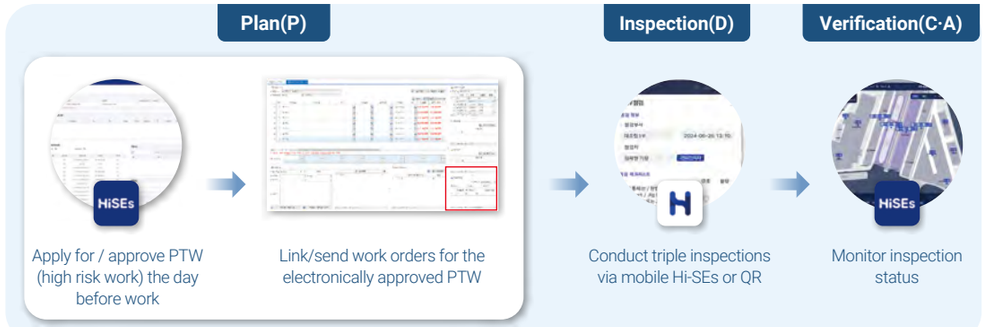
STEP. 3

Triple safety management electronic system (linked to Hi-SEs advancement)
- Triple inspections using QR code/mobile (100% inspection of high risk work)
- Real-time sharing of daily high risk work status (plan/performance)

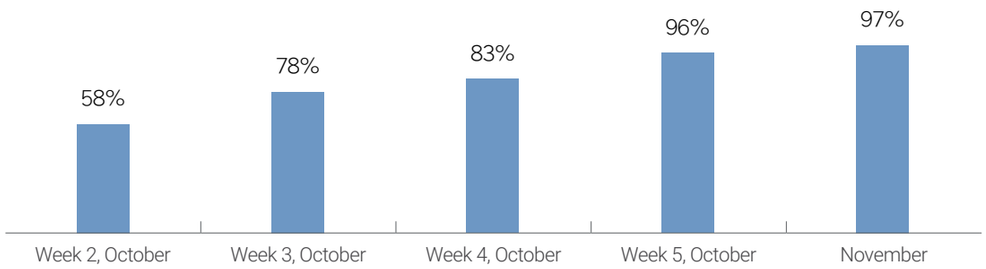
Developing a triple safety management computerized system

To efficiently perform and record inspections of high risk work, we significantly strengthened PTW application and inspection functions in Hi-SEs. For PTW applications submitted the day before work, employees can manage the work schedules in conjunction with work orders. Using the linked data, each player—supervisor, Safe Cover, safety supervisor—can easily perform safety inspections by scanning the QR code on the mobile Hi-SEs app or the PTW.

System Framework



Triple inspection schedule



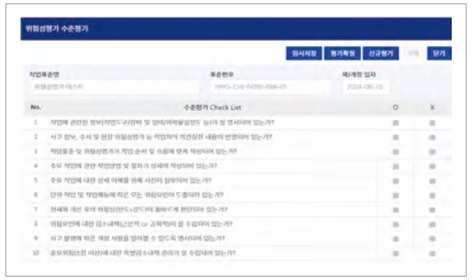
※ Period: After the QR inspection function update on October 7

Risk Assessment System Upgrade

Establishment of Risk Reduction Measures and Using Work Orders

Strengthening of Periodic Risk Assessments

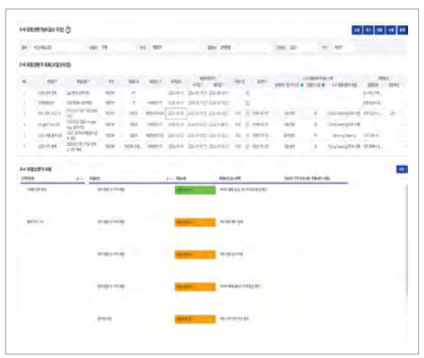
To enhance the completeness of risk assessments, we have added a “risk assessment level evaluation” function to the Hi-Standard periodic risk assessment menu. Through this function, when a risk assessment manager completes an assessment, the department head, manager, and HSE personnel can check and evaluate the risk assessment details using a checklist to provide the missing content.



- Marked “high, medium, low” according to evaluation results
- Users can edit checklist contents
- Users can carry out additional evaluation

Developing ad-hoc / on-site risk assessment systems

When conducting ad-hoc risk assessments in writing, we experienced issues with record maintenance. We developed a menu for ad-hoc risk assessments in the Hi-SEs electronic system to address this issue.
For on-site risk assessments based on the mobile safety work order system, we maintain a 95% implementation rate for managers and an 82% implementation rate for workers. We are currently preparing for additional computerization to improve the quality of on-site risk assessments going forward.



Hi-SEs ad-hoc risk assessment

Manager pre-risk assessment

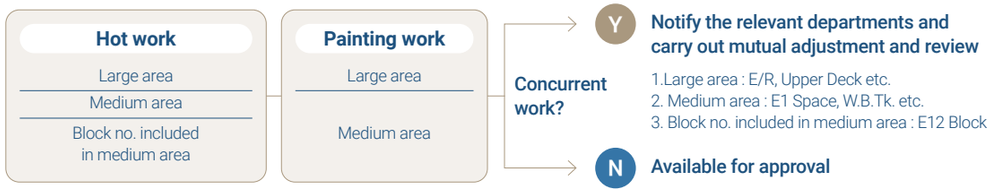
Worker on-site risk assessment

Establishment of Measures for Rational Operation of the Safety Permit and Reporting System

Operability Review of the In-House Safety System and Rational Operation Planning

Strengthening of PTW Concurrent (painting / fire welding devices) Work Filtering / Alarm Feature

To proactively prevent major accidents, such as explosions, due to concurrent painting/fire work, we strengthened the PTW concurrent work filtering function. The one performing hot work must select the block number of the space. In cases where the block selected for the hot work is the block forming a part of the space selected for painting work, even when the two works are performed in different spaces, they constitute concurrent works due to hot work on the reverse side. In such cases, we prevent concurrent work through mutual cooperation on the system level.

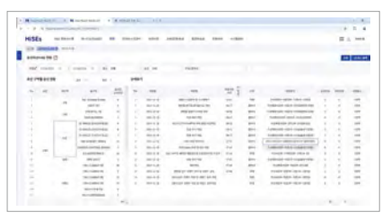


Display PTW for concurrent works

POB System Improvement

The existing POB system was managed electronically based on worker data in PTW applications for each vessel, where some workers were counted multiple times. To address this issue, the system was linked with the mobile safety work order system, which tracks actual personnel input, to manage the direct employees or subcontractor employees boarding each vessel, and separate QR codes are posted to manage external makers or ship owners.

Actual personnel data in mobile safety work orders



Hi-SEs POB status menu

Adoption and Promotion of Global Standards

Analysis and Incorporation of International Safety Regulations

Gap Analysis for Supplementing Standards and Identifying Needs

As shipowners express their growing interest in HSE and international standards and other regulations adopt increasingly stricter requirements, we conducted a gap analysis to improve on our standards and produce the required standard documents. Additionally, we review HSE items in new shipbuilding bid contracts to provide feedback to the sales departments on acceptability, facilitating responses during construction in the field through prior coordination and management.

Creation of New Standards

- Chemical Storage Procedure
- Gas Management Procedure
- HSE Inspection And Audit Procedure
- Personal Protection Equipment Procedure
- Short Service Employee Procedure

Management and Following of Global Accident Indicators (LTIR, TRIR)

To upgrade our standards to the global standards, we compared our LTIR and TRIR indicators with global company standards and analyzed them to redefine indicator management standards. Starting this year, we will share our LTIR and TRIR with customers through Safety Frontier and gradually work toward the global standards.

Analysis of company accident indicators and global accident indicators

- Reselected/managed MTC and RWC targets within TRIR according to global standards
- Expanded organizations included in manhour calculation
- Improved the nearmiss criteria

HHI(2022)		ExxonMobil(2022)	
LTIR	TRIR	LTIR	TRIR
0.126	1.087	0.02	0.16

2024 LTIR & TRIR

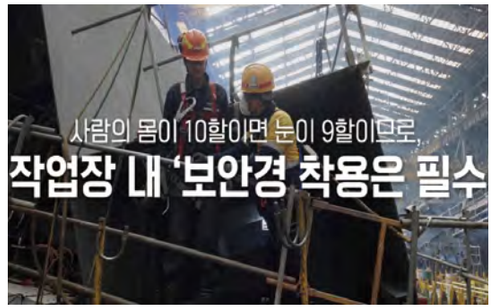
Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Avg.
LTIR	0.151	0.177	0.051	0.197	0.095	0.247	0.000	0.131	0.060	0.091	0.133	0.141	**0.123**
TRIR	1.211	0.709	0.863	0.642	0.663	0.692	0.389	0.653	0.724	0.410	0.622	0.612	**0.677**

* LTIR : Lost Time Incident Rate(No. of lost time accidents per 200,000 working hours)
* TRIR : Total Recordable Incident Rate(No. of all treatment-requiring accidents per 200,000 working hours)

Mandatory Wearing of Safety Glasses

As the first step in strengthening basic regulatory compliance and formalizing the system, we required workers to wear safety glasses from the beginning of this year. Going forward, we plan to gradually strengthen basic regulatory requirements including safety glasses, to upgrade our safety culture to global standards.

Safety short form vide on safety glass requirement



Training video on safety glass requirement

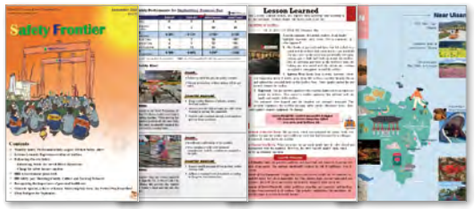
Strengthening of Internal and External Safety Communication

Expansion of Communication Channels

Safety Frontier Publication

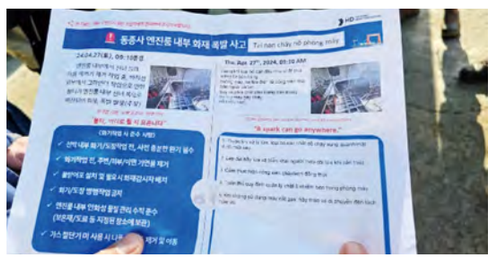
We share information on safety culture improvement such as safety-related programs and safety accident L&L in and outside the company to promote our image as a company focused on safety among our employees and customers, and to realize the social values of ESG management. To this end, we publish Safety Frontier monthly and share them with shipowners and the classification society.

- Accident statistics/analysis and major accidents
- Company safety issues and related programs
- General information related to HSE and common knowledge
- Information for shipowners such as shipbuilding terminology and, in-house rules
- Fact Check (fact verification of various news and rumors)



Horizontal Deployment of Major Accidents at Our Company / Peer Companies

When a major accident occurs in our company or a peer company, we carry out immediate horizontal deployment to review and analyze work standards (L&L) to prevent accidents of the same type in the future. We also prepare one-sheet training materials and distribute them within 24 hours.



Safety Improvement for In-house and External Employees

Expansion of Support for Safety Technology Guidance for Subcontractors

Operation of Training Programs to Build Safety Capabilities of Subcontractor Safety Managers (Safe Clover)

To strengthen safety capabilities, we provide introductory training for Safe Clover appointees. In the future, we plan to improve the program to allow subcontractors to participate as well. Currently, we operate a mentoring program with our own safety supervisors to improve on-site adaptation and safety inspection capabilities.

Safe Clover introductory training

Mentoring program

Expansion of External Subcontractors Audits

We conducted audits and provided technical guidance to strengthen safety not only for in-house subcontractors but also for external subcontractors. In addition, we worked with the Safety Inspection Section to provide joint safety technical guidance over two sessions.

We completed 33 sessions for NYK and Maersk Projects. Going forward, we will continue to provide on-site guidance and technology transfer for work sites posing high risks of major accidents.

Training of Specialists to Engage with Shipowners and Foreigners

Effectively Response to Shipowners and Customer Confidence Building

Securing Expertise in Dealing with Shipowners by Training Specialized Staff

In keeping with the growing importance of HSE and the related works among shipowners and charterers, we hired additional professionals to improve customer reliability through smooth response.
Currently, we are working on shipowner-related tasks with the relevant personnel as a way to secure opportunities for mutual expertise building.

QEL MASS TBM

Confined space special training instructor

Helping Professional Staff Build Their Work Capabilities

To improve the expertise of professional personnel, this year, the three major shipbuilding companies held meetings to improve confined space standards along with a safety benchmarking program in peer companies. As part of the efforts, we carried out benchmarking of the three shipbuilding companies for around a month from June 28 to prevent crane and heavy equipment accidents.

Peer company benchmarking meeting

Peer company in-shop crane benchmarking

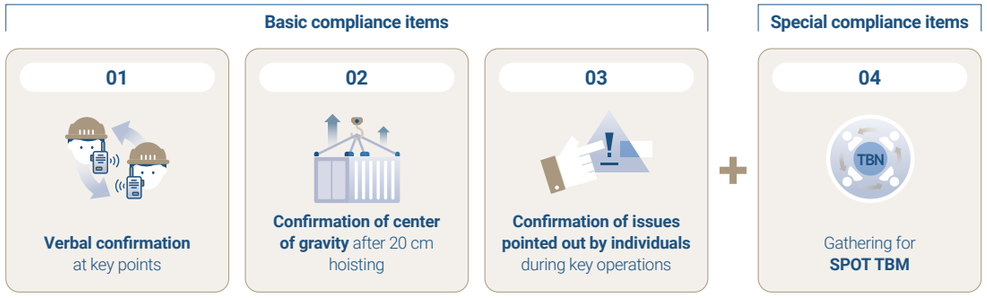
Other Safety Activities

Crane Safety Accident Prevention TF

We operated a crane safety accident prevention task force (TF) to prepare improvement measures for a number of items—system, personnel, technology—through a root cause analysis of crane safety accidents, with which we plan to shift the paradigm of crane safety management. The task force covered all in-shop and out-shop cranes (overhead/gantry/goliath/jib/tower/mobile crane, etc.), and a task force was formed for each sector/crane type to establish strategies customized for each crane.

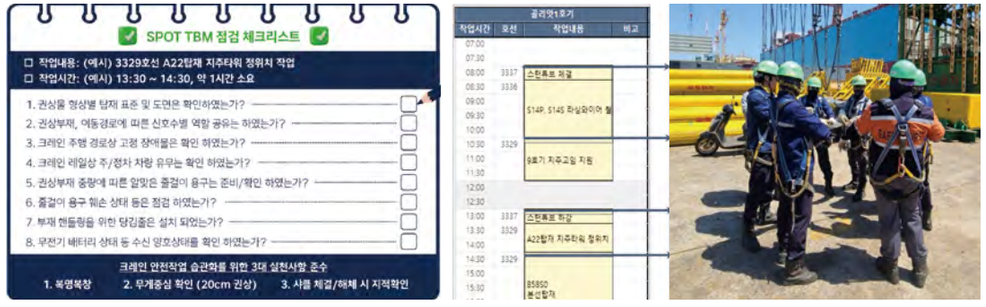
Major Improvements

Establishment of Special Crane Safety Rules



- Issues rule violation certificates and incorporate them in SLI in case of special crane safety rule violations (excluding one-person operations such as pendant crane works)
- In case of a violation, stop the relevant crane, require the workers to complete the required training, and establish measures to prevent recurrence

SPOT TBM



- Spot TBM for G/Crane operations (detailed work list)
- J/C, T/C, mobile, in-shop cranes: for every 2 hours
- Conduct on-site risk assessments using the TBM inspection checklist

Emergency Evacuation Drill

We carry out fire and emergency evacuation drills on a regular basis to improve rapid and safe initial firefighting and evacuation capabilities in case of a fire. For each drill, we consider the specifics of each location and develop various scenarios for buildings, factories, PE sites, and vessels to improve training quality and response capabilities. This year, the Shipbuilding Business Unit conducted a total of 160 emergency evacuation drills.

Emergency evacuation drill (building)


Emergency evacuation drill (vessel)

Classification	Date	Location	Drill Type
1	2024.02.21.	Yard 1 Painting Shop 3	Fire emergency evacuation drill (workplace)
2	2024.04.12.	Vessel No. 3298 (LNG)	Fire emergency evacuation drill (vessel)
3	2024.05.07.	Outfitting shop	Fire emergency evacuation drill (workplace)
4	2024.06.20.	UNIT Shop 5	Response drill for asphyxiation accidents
5	2024.10.07.	Vessel No. 3225 (LNG)	Fire emergency evacuation drill (vessel)
6	2024.12.04.	Main building / Shipbuilding Management building / Culture building	Fire emergency evacuation drill (building)

Management of Safety Golden Rules / Priority Risk Management Tasks

For shipbuilding safety, we actively engage in activities to prevent accidents that may be caused by workers' unsafe behaviors by focusing on the Safety Golden Rules and priority risk management items.

Safety Golden Rule Items


Do not use smartphones/ earphones (while moving/ working).


No smoking (while moving/working)

Comply with the internally regulated maximum speed limit of 30 km/h on the premises (8 km/h for forklifts)


Wear a safety harnesses when working at height


Do not pass underneath any suspended load


Prohibit the arbitrary removal/ disassembly of safety devices from machinery/apparatus.

Comply with lockout tagout (LOTO) regulations in electrical work (locking/marking devices).


Prohibit Simultaneous Operations (SIMOPS) of painting / hot work.


Prohibit the arbitrary installation/removal of fall protection facilities.


Do not skip welding the rear side of a lug.

Prohibit damaging a gas hose or altering a nipple.

Prohibit unauthorized parking on a crane rail.

Priority Risk Management Tasks

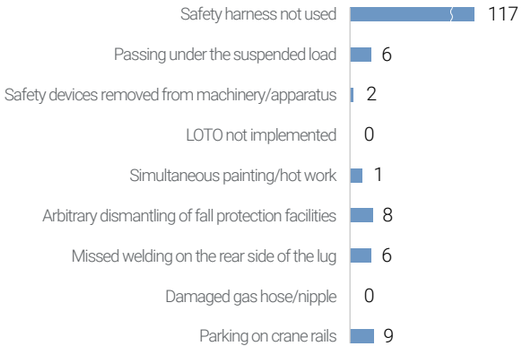
Classification	Priority Risk Management Tasks	Classification	Priority Risk Management Tasks
Common	1) Implementation of safety measures when working in a confined space • Ventilation/lighting, gas concentration measurement, permits for the dangerous work, removing flammables 2) Compliance with fire prevention standards • Removal of backside/underside flammables, utilize fire blankets, and deploy watchers 3) Compliance with PTW regulations and the conduct of a risk assessment	Painting	1) Implementation of fall prevention measures for tank longi work 2) Compliance with the use of explosion-proof lights/lanterns in confined spaces 3) Removal of organic solvents (paint, thinner) from confined spaces
In-Shop	1) Compliance with standards for toppling over prevention of standing steel materials 2) Compliance with the prohibition of leaving cutters inside (or underneath) a block 3) Compliance with standards for using vertical/horizontal clamps	Commissioning / Marine Operation / Mechanical Outfitting	1) Signaler placement and access control for excavator operation 2) Compliance with the job standard when using round sling belts 3) Attaching danger signs around oil tanks and removing inflammable materials
Shipbuilding	1) Checking for lashing and falling objects before lifting 2) Compliance with lashing requirements when cutting the shell plate lug 3) Implementation of standard tank pressure inspection procedures	Transportation	1) No overloading and compliance with the lashing standard 2) Signaler placement for forklift operation

Classification	Priority Risk Management Tasks	Classification	Priority Risk Management Tasks
Outfitting	1) Unit lifting and implementation of measures to prevent toppling over of iron fittings 2) Implementation of standard pipe pressure inspection procedures 3) Compliance with argon gas suffocation prevention measures	7 disciplines / 20 items	

Safety Golden Rule Violations

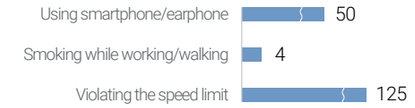
Work-related provisions: 9

Total: 149 cases



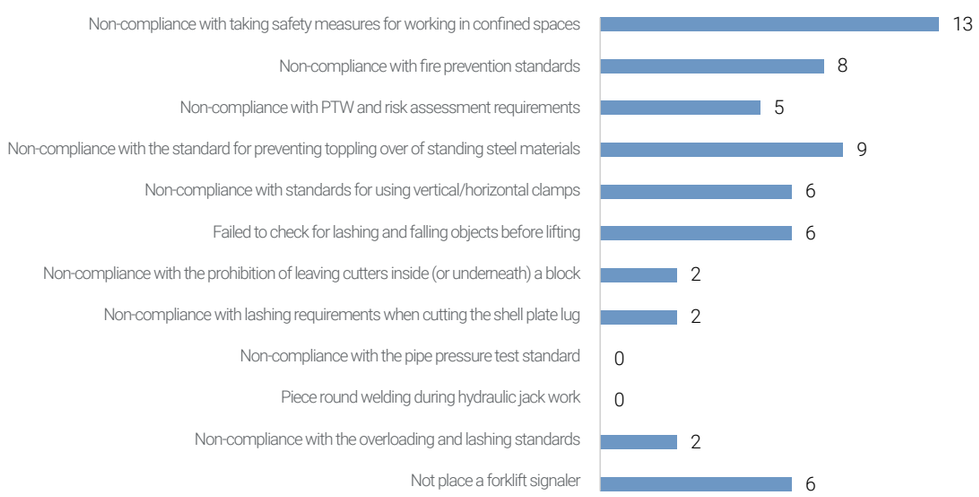
Everyday safety provisions: 3

Total: 179 cases



Priority Risk Management Task Violations

Total: 59 cases



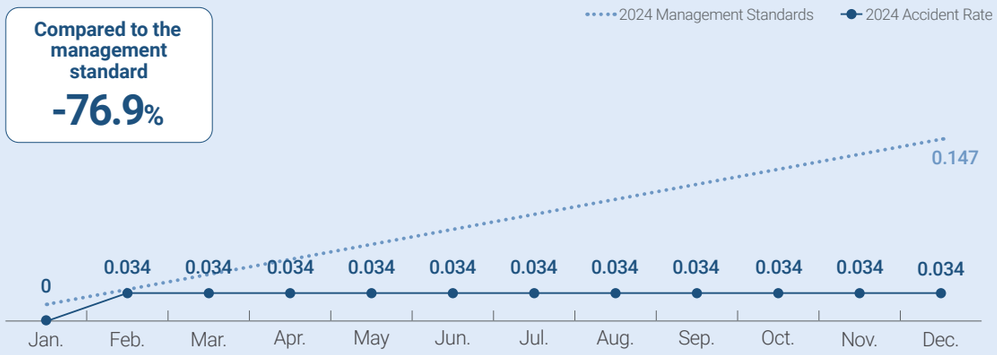
OFFSHORE AND ENERGY BUSINESS UNIT

The Offshore & Energy Business Unit creates new value at sea through its advanced technology and rich experience, utilizing its state-of-the-art facilities such as a super-large 10,000-ton offshore crane, two 1,600-ton Goliath cranes, and a 1 million-ton dock.
It handles the entire EPC process, including design, procurement, fabrication, transportation, installation, and commissioning of fixed and floating production facilities for producing crude oil and natural gas from offshore oil and gas fields. The unit has built its reputation as a trustworthy company by successfully completing more than 170 projects with over 80 global clients.
In addition, in the field of renewable energy, it is ushering in a future of sustainability by building a broad portfolio, including the development of its own floating body models for offshore wind power generation facilities, hydrogen energy business, and small modular reactor (SMR) business.

Safety Management Achievements of the Offshore & Energy Business Unit in 2024

The main safety achievements of the Offshore & Energy Business Unit in 2024 are as follows:
First, we significantly lowered its accident-related industrial accident rate through intensive management focusing on risk assessment and high risk work.
The accident rate dropped to 0.034, 76.9% below the target accident rate of 0.147 for 2024.
Second, we successfully delivered the Shenandoah Project. Despite a topside structure displacement during transfer, all production, design, and safety personnel worked together to successfully meet the delivery date without further accidents.
Third, we laid the foundation for a triple safety management system to focus on high risk work management. We held on-site briefings, listened to opinions, and improved the relevant systems to ensure the successful incorporation of the newly adopted Hi-SEs system, resulting in consistently high inspection and implementation rates.
In 2025, we will continue to strengthen safety management centered on high risk works, and increase the participation and on-site performance of all members to create a workplace that keeps all employees safe.

Compared to the management standard
-76.9%



Classification	2023 (Shipbuilding & Offshore Business)	2024
Fatality accidents	0	1
Accidents (work-related)	46	1
Accident rate	0.187	0.034
Frequency rate*	0.91	0.169

* Based on 1 million working hours

Major Achievements of the Offshore Safety Department in 2024

Detailed Action Plan	Implementation Methods	Major Achievements
Advancing Hi-STANDARD-based work standards / periodic risk assessments	**Applying the advanced Hi-SEs computerized system to offshore yards**	
	Creating a manual for the offshore yard following the advanced development of the Hi-SEs computerized system	Continued to follow up on Hi-SEs advancements related to offshore yard, and incorporate the feedbacks
	Conducting consultation meetings and training with departmental staff of Hi-SEs	Held meetings and training sessions on Hi-SEs advancement with the departments related to offshore yards
Establishing an ad-hoc risk assessment system based on ESP	**Following up on the offshore yard applications and enterprise-wide implementation plans and activities in connection with the Hi-SEs system**	
	Identifying the actual application to the offshore yard according to the development of the enterprise-wide system	Continued to follow up on Hi-SEs advancement improvements
	Identifying improvements and feedback	Continued to follow up on Hi-SEs advancement improvements (computer registration of ad-hoc risk assessments)
Activating on-site risk assessment based on the mobile safety work order system	**Promoting the use of mobile safety work orders (including in-house subcontractors)**	
	Identifying and promoting the use of safety work orders	1. The work order system secured its place in the company with a mobile safety work order assignment rate of 94% and a safety check rate of 94%.(as of Week 3, November, Offshore Production + Construction 5 + Outfitting 5) 2. Mobile safety work order usage rate through M-Ocean: 98% (as of November 22) 3. Improved the mobile safety work order system internally and carried out a follow-up update
	Conducting periodic monitoring of the use of on-site risk assessments	Utilized on-site risk assessment function linked within mobile safety work orders
Advancing the triple safety management system for high risk works	**Unifying the offshore high risk work management system (PTW / fatality accident prevention measures)**	
	Revising high risk works by offshore department (selected by Act)	Completed selection of works subject to triple safety management by matching existing PTW items and department-specific fatality accident prevention measures, and categorized them further on the Act level
	Conducting consultation meetings to select work subject to electronical / face-to-face / on-site permits	1. Discussed and categorized works subject to electronic/face-to-face/on-site permits 2. Continued to provide feedback according to Hi-SEs computerization development progress
Establishing a self-regulated safety organization led by the production departments	**Reestablishing PTW approval authorities for each safety and production task**	
	Holding consultation meetings to discuss works subject electronic/face-to-face/on-site permits (production departments)	1. Completed consultation on selection of works subject to permits 2. Incorporated the checklist for works subject to triple safety management into the Job Standard Procedure (JSP)
	Continuously checking the implementation of triple safety management	1. Conducted weekly regular inspection/feedback review (implementation of fatality accident prevention measures) 2. Currently implementing triple safety management through regular on-site operability review and on-site feedback

Strengthening of Site Management for Successful Delivery of the Shenandoah Project

Safety Standards for Recovery Processes

After the Shenandoah project accident, we established and implemented safety standards to prevent secondary accidents during the internal access for on-site accident investigation by our staff and the related agencies. We took safety measures in advance, which included placing concrete mats, grid plates, and other supports to prevent additional overturning, using walking robots and drones for on-site investigation, pre-dismantling areas with potential scaffold collapse, and installing barricades and lighting. Subsequently, we applied systematic safety procedures to ensure safe accident investigation, such as defining safe passage routes, completing access request forms, designating representative escorts, and guiding safety supervisors.

Preliminary Survey → Likelihood of uppe objects falling an additional overturning

Safety Measures → Obstacle removal and protective measures

Defining Safety Passage Zones → Defining and securing safety passage routes

Accident Investigation → Accident investigation by the relevant agencies

After the investigation of the Shenandoah accident site by the related agencies, we established and implemented “Recovery Work Safety Management Principles” to prevent accidents that may occur during site access and recovery. Major measures included reinforcing scaffolding and grating to set up safe passage routes, holding SIMOPS meetings one day before work to share work content by discipline and conduct risk assessments, thereby predicting and blocking potential risk factors in advance. In addition, all personnel participating in recovery work received in-house safety training and were issued recovery work Induction stickers to attach to their hardhats, and only personnel wearing LED orange safety vests were allowed to access the site, creating a safe recovery work environment through systematic and thorough procedures.

Scaffold reinforcement and safe passage route setting

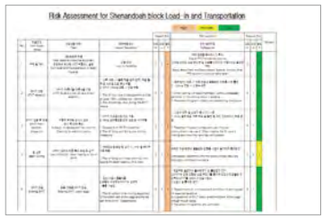
SIMOPS Meeting

Pre-entry safety training

※ SIMOPS(Simultaneous Operations) : Risk assessment and coordination for concurrent work

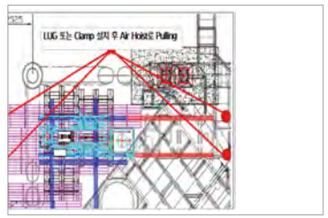
Implementation of Risk Assessment for Major High Risk Works

We carried out prior risk assessments for high risk works (SPMT transportation) and non-routine works (ground reinforcement, platform cutting, etc.) related to recovery from the Shenandoah accident to prevent further accidents. Ad-hoc risk assessments were reviewed before issuing PTW to predict and block potential risk factors during high risk and non-routine works, and site management was carried out to ensure safe work performance through careful verification and countermeasures.



Module transportation


Topside integration



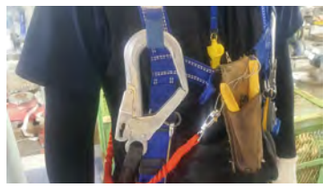
F.W pump skidding

Implementation of Double Safety Measures to Prevent Falling/Dropping Accidents after Integration

To remove falling objects and drop hazards at the Shenandoah site and create a safe working environment, we installed safety nets in consultation with the related departments. Main efforts included installing safety nets for falling objects in the overbridge passages and the safety railing areas of each deck, as well as installing fall prevention nets under the lower deck. In addition, we engaged in activities to promote safety awareness, which focused on instructing workers to use tool boxes to prevent falling objects and promoting the use of individual tool lanyards. Through these efforts, we minimized risk factors at work sites and fostered a safe working environment.


Falling prevention net installation


Falling object prevention net installation


Use of tool lanyards

Creation of an FPU Safety Management Manual

We systematically organized the safety management experience and lessons from the Shenandoah FPU construction into a safety management manual. The manual was created to ensure a clear understanding and application of safety management standards in future FPU projects. The main contents include FPS construction performance, FPU risk management items, and key management items by discipline, which will contribute to ensuring safe FPU construction and fostering a sustainable safety culture.

Activation of Production Communication/Empathy/ Collaboration

Meetings with Production Department Heads, Safe Clover, and Subcontractor Safety Managers

We hosted periodic safety meetings with production department heads to share on-site and enterprise-wide safety issues and discuss management plans. At these meetings, we listen to the opinions of production departments and seek improvement measures through collaboration, continuously striving to create a safer working environment.
In addition, we continue to strengthen our communication activities through meetings with Safe Clover and subcontractor safety managers. At these meetings, we listen to safety managers' concerns by disciplines, build consensus on safety issues, conduct training, and clarify the roles and responsibilities of safety managers. Through these meetings, we strive to continuously improve voluntary safety management capabilities.


Meetings with production department heads


Meetings with Safe Clover and subcontractor safety managers

Special Crane Safety Training and Briefing

The Offshore Safety Department continuously conducts education and briefings for operators and signalers to prevent crane accidents and makes various efforts to prevent similar accidents. In particular, for each change, including the introduction of new subcontractors or new crane safety rules, we do our best to actively gather on-site opinions and form consensus. For example, we held a safety briefing for operators and signalers of a new subcontractor, Kyungduk Tech, sharing past crane fatality accidents that occurred in our company, conducting training on safety rules for accident prevention, and clarifying their roles and responsibilities.
In addition, we provided training on special safety rules for crane-related workers at offshore sites (operators, signalers, and personnel with pendant remote control certifications, a total of 196 people over 4 sessions) and supervisors, along with efforts to achieve meaningful improvements based on trust from the field by continuously reviewing and encouraging rule compliance in the field.

Special crane safety rules briefing

Special safety training for new subcontractor (Kyungduk Tech)

Sharing of On-site Issues Through Regular/Occasional On-site Inspections

We carry out scheduled inspections more than once a month to prevent fatality accidents. Works subject to inspection include high risk works such as confined space and argon works. We thoroughly review the implementation status of safety measures for the selected works. In addition, recurring problems and major issues are quickly shared with on-site departments to induce improvement measures, along with continuous efforts to create a safe working environment.

Month	Inspection Items	Month	Inspection Items
Jan.	Gas cutting equipment / TP transportation	Jul.	Forklift / cherry picker / scissors car / crane
Feb.	Mobile crane / overturn prevention measures	Aug.	Crane / foreign worker work practices
Mar.	Cherry picker / flame resistant clothing	Sep.	Special crane inspection
Apr.	Forklift, TT Car operation / gas cutting equipment	Oct.	Cherry picker / flame resistant clothing / confined area / scaffolding
May	Fire explosion safety measures / foreign worker working pattern	Nov.	Confined area / argon work
Jun.	Protective equipment, working environment condition / electrical / crane	Dec.	Fire prevention special inspection

Oxygen, ethylene leakage (issue)

Foreign observer with poor Korean language skills (issue)

cherry picker operation performed after setting up warning lights and barricades (improvement)

Excellent pointing and calling after shackle connection (improvement)

Site Safety Improvement and Gray Zone Identification

Improvement of On-site Unsafe Elements Through Safety Standard Establishment

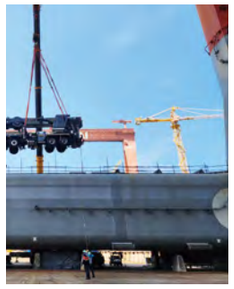
When workers are accustomed to repetitive work and on-site environments, it may lead to failure to recognize and address risk factors even when they are exposed, which increases the likelihood of accidents. As such, we actively identified unsafe factors widely referred to as “Gray Zone” factors and established and disseminated measures to address them. We also engage in proactive efforts to eliminate risk factors.

Improvement of Comp' Rm Shipping Method (SPMT timber installation standard exceedance)

In the process of transporting compressor rooms built in offshore sites for delivery to the Shipbuilding Business Unit, we identified cases where the quantity of timber under the SPMT exceeded the standard, exposing the block to a risk of overturning. To comply with the timber usage standard (5 layers or less), we adjusted the height of the block support installed on top of the barge in consultation with an external SPMT company to install and transport five layers of timber or less.

Standards for Mobile Crane / Sky / Forklift Hoisting

Heavy equipment sometimes needs to be transported to the upper part of the vessel or to other positions to adapt to various work environments. As such, we moved the equipment in accordance with the manufacturer's hoisting standards, but identified and improved on ambiguities or deficiencies in the standards. In particular, to prevent overturning that may be caused by an imbalanced center of gravity during hoisting or the slippage of a connection part, we conducted hoisting demo tests and established hoisting standards for related equipment in cooperation with the production organizations.



Application of LED lights to Night Work Forklift for Hazard Identification

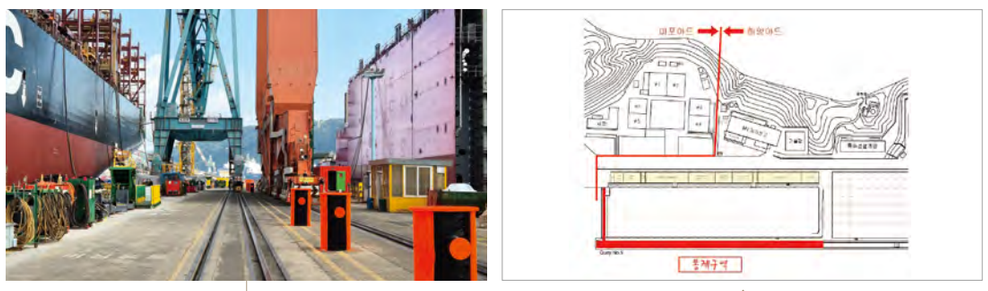
Forklifts are essential and frequently used in heavy industries, which means a risk of serious consequences in case of accidents. This risk increases, especially during night work with limited visibility.
An LED application demo test was conducted to identify the hazard range of forklifts during night work, for which the final investment has been confirmed and preparation is under way.

Prevention of Accidents and Improvement of Logistics Flow by Establishing In-House Parking and Traffic Standards

With the rapid increase in motorcycle commuting to and from the offshore yard, motorcycles parked on main roads frequently disrupt block logistics, and uncontrolled entry into work areas such as quay walls has increased the risk of in-house traffic accidents.
In response, in cooperation with the relevant departments, we designated the northern end of Offshore Quay Wall 5, which has a high risk of accidents, as an off-limit zone for bicycles and motorcycles. Motorcycle parking on main roads was prohibited and new motorcycle parking lots were expanded to reduce in-house traffic accidents and resolve disruptions to logistics flow.

Before/After On-site Improvement

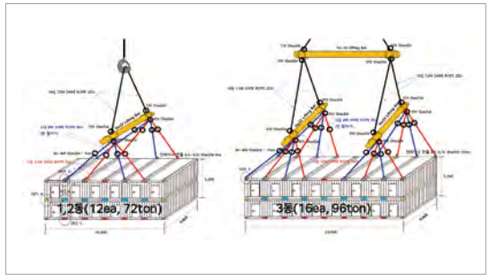
Parking lot establishment / Main road parking standard establishment



Northern end of Offshore Quay Wall 5 designated as a motorcycle/bicycle control zone

Risk Assessment and JSP Revision for Non-routine/High-risk Works

Thorough prior review and preparation are essential to prevent accidents in non-routine work. Ad-hoc risk assessments are required for non-routine work such as steel fender cutting, goliath elevator separation, and transportation of linked containers. If necessary, we make efforts to eliminate fundamental risk factors in advance through design reviews and on-site meetings with production departments.



Linked container transportation (design review)

P78 steel fender cutting

Container ship lashing bridge transportation

Month	No. of Assessments	Month	No. of Assessments
Jan.~ Feb.	4 cases	Jul.~ Aug.	9 cases
Mar.~ Apr.	21 cases	Sep.~ Oct.	6 cases
May~ Jun.	10 cases	Nov.	4 cases

Ad-hoc risk assessment statistics by period

In addition, to prevent major accidents, we reviewed standards for works subject to triple safety management (face-to-face/on-site permits) and incorporated key management items. The triple safety management checklist was added to existing work standards to recheck the risks from the relevant works and clarify accident prevention measures.

No. of work standard revisions subject to triple management

Classification	Works subject to triple management (face-to-face/on-site)	Work standards (direct)	Work standards (subcontractors)
Out-Shop 5	14 cases	14 cases	15 cases
Offshore 1	9 cases	9 cases	12 cases
Offshore 2	22 cases	22 cases	15 cases

Establishment of a High Risk Work Management System through Selection and Focus

Unification of the High Risk Management System (strengthened PTW linkage and triple safety management)

With the completion of the Hi-SEs advancement development and the strengthening of high risk work management, the Offshore Safety Department took proactive and diverse measures for the rapid settlement of the new system and safety management operation that meets its purpose. In particular, fatality accident prevention measures were concretized and unified with the existing PTW system in cooperation with production departments. Additionally, materials were created and distributed, and briefings were conducted so that the three subjects—supervisor, Safe Clover, and safety supervisors—could conduct thorough high risk work inspections together. Subsequently, on-site safety was quickly realized by sequentially conducting listening to difficulties and improvements, and checking on-site execution power.

STEP. 1
- Unified fatality accident prevention measures / works requiring PTWs at the sub-unit level
- Created and disseminated a checklist and a pocketbook for the selected works

Created and distributed a PTW management pocketbook

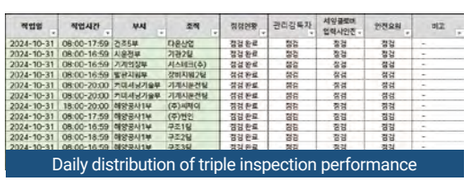
STEP. 2
- Created and distributed a user manual
- Held a briefing meeting to improve understanding of new Hi-SEs and on-site cooperation (3 days for each department)


Supervisor briefing

STEP. 3
- Listened to system issues and receive feedback
- Listened to challenges in on-site application and consider improvements


On-site execution power inspection/guidance

STEP. 4
- Monitored strengthening on-site execution power
- Conducted on-site inspection and guidance/ corrective measures for organizations with inspection performance


Daily distribution of triple inspection performance

Safety Activities through Collaboration with Clients

We work closely with clients to achieve project management focused on safety for the successful delivery of contracted projects. We strengthen on-site safety through systematic activities such as joint audits including grating, confined space, rigging & lifting, electrical equipment inspections, HSE walkthroughs, HSE meetings, and SIMOPS safety meetings. In addition, we promote safety awareness with safety incentive programs and campaigns, while striving for the common goal of safe and successful project completion with clients.

Joint on-site Safety Inspections and Subject-specific Audits

We conduct weekly joint on-site safety inspections with clients to identify hazards, unsafe behaviors, and environmental issues in the workplace in advance. We focus on promptly addressing identified issues and preventing potential safety accidents in advance, and systematically manage to prevent the recurrence of the same issues by organizing the results into reports and actively sharing and cooperating with clients to resolve issues.


Weekly Safety Walkthrough

During the construction of offshore projects, we conduct safety audits with clients on various on-site hazard themes. A total of 170 audits were conducted including safety walkthroughs and grating inspections, in which we identified 1,166 on-site safety items. 453 of them were confirmed as safe, and 713 were confirmed as unsafe. All unsafe items have been addressed to keep the sites safe.


Rigging & Lifting Audit

Safety Walkthrough / Findings Performance (Unit: cases)

Activity		Number of execution	Findings		
			Safe	Unsafe	Total
Safety Walkthrough		95	164	570	734
Grating Inspection		25	154	59	213
Audit	Rigging Lifting	18	35	47	82
	Dropped Object	10	27	19	46
	Confined Space	15	52	14	66
	Electrical Equipment	7	21	4	25

* All unsafe findings have been addressed.

Incentive Programs and Weekly Safety Meetings

Incentive Program

The key to a safe workplace is to provide various safety rewards to foster workers' safety awareness and foster a safety culture. Weekly incentives are provided to outstanding employees who perform on-site safety activities or safety work, and quarterly and monthly outstanding safety individuals/teams are selected and rewarded. Weekly award recipients received amenity vouchers, monthly award recipients received hotel vouchers, and quarterly recipients selected at the team level received additional prize money. This system contributes to raising workers' safety awareness and keeping the offshore yard safe.

Weekly Safety Meeting

Weekly safety meetings are held with clients to prevent accidents and keep the workplace safe. In these meetings, we share hazards and issues identified in the workplace and discuss ways to address them and build a safety culture. In addition, information such as KPIs, walkthroughs, and HSE issues are shared to check the current safety level and discuss improvement measures, thereby strengthening cooperation with clients and focusing on raising workers' safety awareness.

Incentive Program

Safety Award(Project)	Weekly	Monthly	Quarterly
Select award recipients	Conduct on-site confirmation of individuals with excellent safety work / safety activity performance (At all times; awards given on the spot)	Select individuals with excellent safety work / safety activity performance over a month (Separately selected every month)	Safety work performance over 3 months / Select outstanding safety activity teams (Separately selected every quarter)
Awards	KRW 2,000 amenity vouchers (KRW 100,000 / week)	Hotel vouchers 1st place: KRW 200,000 2nd place: KRW 150,000 3rd place: KRW 100,000	Team prize money 1st place: KRW 500,000 2nd place: KRW 400,000 3rd place: KRW 300,000
Total project performance	KRW 10,500,000	KRW 9,450,000	KRW 8,400,000

Business Support and Preparation for Awarded Projects

Bid Document Review and Sales Support

The Offshore Safety Department spares no cooperation and support from the sales stage for the successful performance of offshore projects. It supports the sales departments through HSE performance And Pre-Qualification verification, and reviews the minimum standards and procedures related to HSE according to client requirements such as IOGP regulation application, provides advice to the sales departments through analysis of contract poison clauses, evaluation of HSE cost adequacy, and contract content analysis, facilitating systematic contract conclusion and preparation. Building on these preparations, we focus on the successful performance of the awarded projects while further strengthening clients' trust with us. Since winning the Trion and Ruya projects, we have been systematically responding at each stage including initial project planning, safety process management, efficient resource allocation, and the provision of customized solutions aligned with customer requirements. In particular, considering the characteristics of offshore projects that require high levels of safety management and environmental protection, we strictly comply with international and domestic regulations, and manage safety, quality, and efficiency as top priorities in the process preparation and execution process.

Preparation for Successful Construction of Awarded Projects (Trion/Ruya)

Trion is an FPU floating production facility to be installed in the Gulf of America. We completed contract reviews for this project as well as the preparation and submission of required documents, and successfully negotiated key safety matters with the client.

We held the Steel Cutting Ceremony, which constitute the first step of the main construction process. Currently, we conduct thorough on-site safety inspections starting with the workspace where the process began, laying the foundation for the successful completion of the project.

Ruya is a Fixed Platform to be installed in the Persian Gulf. We analyzed safety issues and closely coordinated with the client from the contract stage, negotiating matters requiring in-depth discussion face-to-face through mutual site visits. Benchmarking was conducted with peer companies that worked on the client's previous projects to prepare strategic response plans. Currently, all 24 submission documents have been completed, and we are looking for sustainable ways to ensure safe construction.

Trion S/C Ceremony


TBM before the start of Trion Project operations


Ruya Project completed

The Naval & Special Ship Business Unit, which has been playing a pioneering role in the independence of Korea's shipbuilding industry starting with the development of the first Korean-built frigate "ROKS Ulsan" in 1975, has developed the Aegis-class destroyer "King Sejong the Great" and various state-of-the-art naval ships with its technology. It is also actively advancing into the world market and is recognized for its technological prowess. The Naval & Special Ship Business Unit, positioned as another pride of HD HHI, will continue expanding its world-leading technological capabilities by partnering with domestic and foreign research institutes and combat system developers based on its professional workforce and state-of-the-art technology.

Safety Management Achievements of the Naval & Special Ship Business Unit in 2024

In 2024, the Naval & Special Ship Business Unit reported two accident-related industrial accidents with an accident rate of 0.107, recording an 18.9% decrease under the management standard.
In 2024, we have been focusing our safety capabilities on the top priority goals of "high risk work triple safety inspection" and "risk assessment advancement", continuously achieving zero fatality accidents since 2020.
In 2025, we plan to focus on strengthening the on-site operability of the new safety management system (New Hi-SEs) and strengthening safety communication to strengthen members' safety awareness and capabilities.

Compared to the management standard
-18.9%

Classification	2023	2024
Fatality accidents	0	0
Accidents (work-related)	0	2
Accident rate	0	0.107
Frequency rate*	0.000	0.514

* Based on 1 million working hours

Major Achievements of the Naval & Special Ship Safety Section in 2024

Detailed Action Plan	Implementation Methods	Major Achievements
Advancing work standards and periodic risk assessments related to Naval & Special Ship works	**Enhancing user convenience / utility**	
	Opening the web-based work standard system	Completed application of a web-based work standard system
	Using kiosks to increase the utilization of workers	Completed installation of on-site kiosks
	Streamlining work standards	
	Reviewing and consolidating registered work standards	• Work standard system improvement - Distinguished between used/unused work standards and kept unnecessary standards inactive • Work standard integration - Considered the integration performance in periodic risk assessment in 2H
Establishing an Ad-hoc Risk Assessment System Based on ESP	**Implementing risk assessment for all non-routine work**	
	Providing safety feedback related to design, production, and non-routine works	Non-routine work PTW management - 100% feedback on ad-hoc risk assessments
Activating on-site risk assessment based on the mobile safety work order system	**Utilizing safety work orders based on work standards**	
	Monitoring on-site risk assessment performance using work orders by work organization	Developed and deployed mobile on-site risk assessment development and monitored the on-site risk assessment usage rate
Conducting training and promotions to encourage risk assessment	**Providing visiting safety training**	
	Selecting/training underperforming production teams / subcontractors	TBM monitoring
Advancing the triple safety management system for high risk works	**Refining departmental measures to prevent fatality accidents**	
	Offering consultations on refining and selecting items (production/support)	Completed negotiation on specific items in the May safety management meeting (consensus built) Agreed on specific items and unified fatality accident prevention measures and PTWs
	Implementing the monitoring of high risk work with multiple safety management systems	
	Providing feedback through multiple periodic safety management system monitoring for high risk works	Monitored triple safety inspection for High Risk works (monthly safety management meeting) Monitored high risk triple safety inspection using Hi-SEs
Establishing a production-led autonomous safety organization	**Encouraged the discovery of gray zone risk factors**	
	Presenting safety rewards for discovering and addressing gray zone risk factors	Reported the identified production / design / gray zone risk factors in Naval & Special Ship safety management meetings

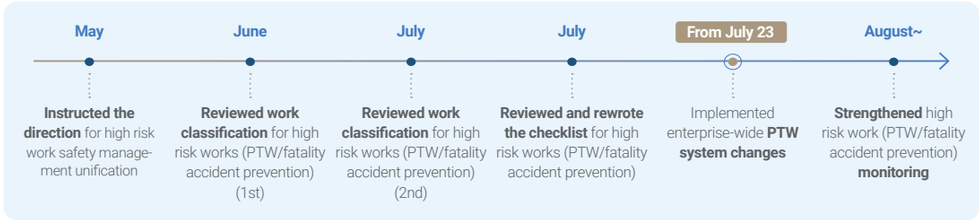
Advancement of the Triple Safety Management System for High Risk Works

High Risk Work Safety Management System

Unification of the High Risk Work Safety Management System

Through continuous review and feedback, we have been improving the fatality accident prevention measures established in 2021. In 2024, we defined the specifics of the department-specific fatality accident prevention measures and unified them with works requiring PTWs. Through these efforts, we unified the inspection of fatality accident prevention measure with the PTW inspection, which had been managed on separate tracks. This allowed us to redefine inspection items and perform more focused management of high risk works.

High risk works/PTW unification targets and application status



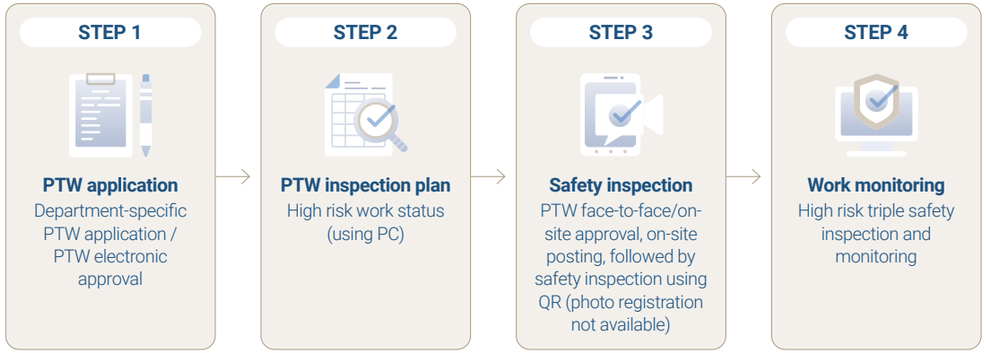
Classification	Department	Double	Triple Safety Management		Sum
		Electronic	On-site	Face-to-face	
Production 1	Special) Hull Production Department	9	1	7	17
	Special) Outfitting Production Department 1	11	4	6	21
	Special) Outfitting Production Department 2	6	3	11	20
Production 2	Special) Commissioning Department	16	2	17	35
	Special) System Integration Department	6	5	0	11
Shipbuilding	Vessel Control Department	1	1	0	2
Common	All departments	0	7	2	9
	Total	**49**	**23**	**43**	**115**

	Electronic Permit	Safety Face-to-face Permit	Safety On-site Permit
Application	O(Relevant departments)		
Electronic approval	O(Relevant departments)		
Safety supervisor face-to-face/ reception	X	O	O
Safety supervisor on-site verification	X	X	O
Inspection	Self-regulated safety management	**Triple safety management**	**Triple safety management**

Monitoring of High Risk Works with Multiple Safety Management Systems

In the Naval & Special Ship Business Unit, QR has been applied to the high risk work triple safety inspection to enable efficient safety management, overcoming an environment where technical improvements were difficult due to defense security. In line with the enterprise-wide system, supervisors, Safe Clover, and safety supervisors scan the QR of the PTW posted on-site before work to conduct safety inspections using a check-list appropriate for the work, and the results are monitored in real-time.

Monitoring Process



Period : 10/8~11/21 (Weekdays)

Classification	Daily Average	Inspection Implementation Rate
Total	38.5 cases	98.3%
Supervisors		98.5%
Safe Clover / Cooperative safety		98.8%
Safety Supervisors		99.7%

A Safety Management System Focused on Preventing Fatality Accidents

Gray Zone Risk Factor Identification

Planned Inspection

The Naval & Special Ship Business Unit uses safety accidents that have occurred in our company and peer companies as a negative example, selecting risk factors that could occur within the workplace as planned inspection items to focus on accident prevention activities.
Through planned inspections, risk factors in the workplace are identified in advance, and identified issues are improved through F/Back, contributing to safety accident prevention.

Planned Inspection Items

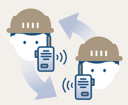
Classification	Inspection Items	Classification	Inspection Items
Jan.	WHS production site / Gas cutting equipment and hose	Jul.	Electrical accident prevention / Scissors lift
Feb.	Diving	Aug.	Air jacket
Mar.	Motorcycle illegal parking / Crane CCTV	Sep.	“3 Commitments” for cranes (in-shop/out-shop)
Apr.	U-brace / Lifting lug welding condition inspection	Oct.	On-site container (1st) / Winter two-wheeled vehicles
May	Tool Box	Nov.	Special crane safety rules / Confined space / On-site container inspection (2nd)
Jun.	“3 Commitments” for cranes (out-shop)		

Planned Inspection Results

Special Crane Safety Rules Inspection

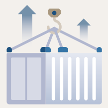
Inspection date: November 4-5 (Monday-Tuesday)

01



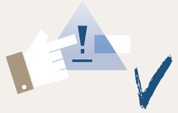
Verbal confirmation at key points

02



Confirmation of center of gravity after 20 cm hoisting

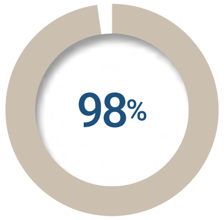
03



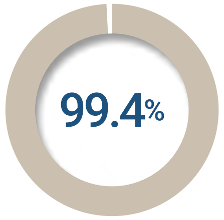
Confirmation of issues pointed out by individuals during key operations

04

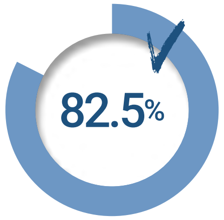
Gathering for **SPOT TBM**



- Total of 305 cases
- Good: 299 cases
- Poor: 6 cases



- Total of 167 cases
- Good: 166 cases
- Poor: 1 cases



- Total of 252 cases
- Good: 208 cases
- Poor: 44 cases

- Total of 200 cases
- Good: 187 cases
- Poor: 13 cases

Horizontal Deployment Safety Improvement for Major Accidents

Elimination of Transporter Collision Risks

The Naval & Special Ship Business Unit identified and addressed collision risk factors that could occur when moving blocks with transporters in narrow areas within the yard. With the enlargement of blocks, there was always a risk of accidents due to interference around the yard during block movement. In response, we prepared improvement measures by listening to the opinions of production departments and transporter signalers. Efforts were made to eliminate fundamental risk factors through measures such as securing storage space, creating safety lines (fluorescent painting), removing surrounding interferers, and establishing rules on block size limitation.

Elimination of Transporter Collision Risks

Issues during transporter movement

Example of improvement measure in action: 7PE site space secured (safety line) and visibility of protruding parts ensured

Horizontal Deployment Activities after the KVLS Incident

Regarding the KVLS incident in January, we created and introduced a dedicated jig to the on-site to enable physical safety measures in addition to LOTO when external manufacturers work, to eliminate caught-in accident risks.

In addition, we identified areas previously considered outside the management area considering the nature of the defense industry, such as defense manufacturers and crew management, and classified them as vulnerable safety management areas. We established fundamental measures to prevent the recurrence of the same accident, enabling double and triple safety.

Identification of vulnerable management areas

Specialized jigs for KVLS cell/ventilation hatch

Naval and Special Ship and Surface Vessel Ventilation Improvement

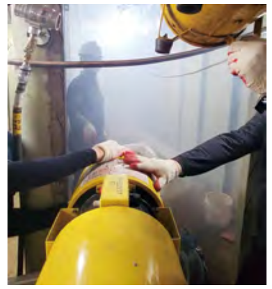
The Naval & Special Ship Business Unit is driving the ventilation improvement for naval ships, special ships, and surface vessels through a task force composed of safety and production departments.

We prepared improvements for vessel ventilation through on-site inspection with the Technical Consulting Center, followed by a proof of concept for ventilation measures by installing jet fans on surface vessels. We will do our best to prepare ventilation measures suitable for naval and special ships through continuous inspection and verification through on-site visits.

* Expected to be deployed to P172 (7 dock)/P178 (6 dock) vessels in 2025

Ventilation improvement

Jet fan installation to improve internal ventilation for surface vessels



Jet fan performance proof of concept

Establishment of Diving Standards

As part of the horizontal deployment following a fatality accident related to diving at a peer company, the Naval & Special Ship Business Unit established job standards and conducted diving inspections within the unit. Diving requires close cooperation between design and production departments at the outset, and failure to transmit required information creates a high risk of accidents. We clarified the roles and responsibilities of each department/subcontractor to prevent safety accidents related to diving in advance.

Diving Standard Procedures

	직영(운항관제부)	협력사	운영주관 부서	특수선 안전
작업 계획 단계	✓ 시운전 일정표 및 프로펠러 크리닝 작업 가능 일정 확인(시운전부) ✓ 작업 계획 수립 및 지시 ✓ 위험작업 허가 신청(D-1)	✓ 계약 (입찰 관련 서류 제출) ✓ 단기공사 출입 신청(D-2~3일) ✓ 위험작업 허가 신청(D-1일)	✓ 호선별 물량 산출 및 계약(종합설계부) ✓ 작업일정 협의(시운전부) ✓ 작업 지시 및 현황 카톡방 운영	✓ 업체 선정 검토(안전관점) ✓ 위험작업 허가 승인(D-1일)
작업 준비 단계	✓ LOTO체결 - M/E 터닝기어, S/G , ICCP, ECR M/E, CCR Pump, BWTS Seachest 모터, Hi-Ais 등 ✓ 위험작업 허가 신청서 제출 ✓ 안전 TBM실시 - 장수사 건강, 기상조건 확인 ✓ 잠수 장비 점검 - 공기통 잔압확인, 비상용탱크 비치, 통신장비, 헬멧/마스크, 잠수복, CCTV 등	✓ LOTO체결 - 좌동 ✓ 관련 서류 제출 - 작업계획서, 표준작업지도서, 잠수자격증, 위험작업 허가 신청서 *잠수 인원 변동 시 반드시 재신고 ✓ 안전 TBM실시 - 잠수사 건강 상태, 기상조건 확인 ✓ 잠수 장비 점검 - 송기설비(콤프레셔, 비상기체통, 호스), 비상용탱크 휴대 외 좌동	✓ 타부서 연관 작업 확인 → 병행작업 금지(일정 조율) ✓ 작업 착수 전 유관부서 공지 - 메일 활용 ✓ 작업 착수 당일 유관부서 재공지 - 카톡방 활용 * 운영 주관 부서 R&R 정례화 - 종합설계부 현장 관리력 부족으로 현장 특이사항/임의 변동사항에 대한 모니터링 어려움 → 계약 및 업체선정(종합설계부) 현장 관리(시운전부)	[작업 전 위험작업 현장 허가 실시] ✓ LOTO 확인 (감시인 배치 여부) ✓ 잠수 인원 점검 - 잠수 자격증 및 당일 잠수 인원 확인 - 잠수 2인1조 및 지상 보조 인원 배치 *매일 작업 착수 전 자격증 재확인 ✓ 잠수 장비 확인 - 송기설비/호흡통 기체통 확인 - 비상용탱크 비치 여부 (육상 콤프레셔 사용 시 휴대할 것) - 부력조절기(납), 칼 , - 신호줄, 시계, 압력계(or 통신장치) ✓ 비상 상황 대비 상태 점검 - 체세동기, 구급약, 신고절차 숙지
작업 수행 단계	✓ 본선 프로펠러 폴러싱 작업 - 해상관제실 항내 운항 정보 공유 - 엔진룸 감시인 배치 오작동 차단 - 안벽 보조인원 배치 비상 시 대비	✓ 수중 크리닝 전 Live CCTV검사 - 외판 오염도 확인 및 작업 방법 결정 ✓ 수중 크리닝 작업 (2인 1조 잠수) ✓ 비상 상황 시 신고(주관부서, 안전)	✓ 작업 진행 사항 모니터링 및 공유 - 항내 운항 정보(운항관제부) - 비상 상황 시 안전부로 신고 - 유관부서 업무 업조 및 일정 조율	✓ 잠수 작업 중 수시 모니터링 ✓ 비상 상황 시 긴급 조치
작업 완료 단계	✓ 작업 정리 - 작업도구/잠수장비 정리정돈 - 스티커 회수 및 LOTO해제 - 해상11호 계류 및 로프 확인	✓ 작업 정리 - 스티커 회수 및 LOTO해제 - 전원/유탈리티 차단 확인 - 작업도구/잠수장비 정리정돈	✓ 일일 작업 종료 후 변동 사항 확인 및 유관부서 공유 - 잠수인원, 일정변동 등 특이사항 ✓ 최종 작업 결과 확인	✓ 작업 종료 여부 모니터링

Diving Team (Direct Employees / Subcontractors)

- PTW required
- LOTO
- Submit the relevant documents
- Report in case of personnel change

Operating Department

- Coordinate work schedules
- Check works related to other departments
- Notify the relevant departments before/on the work start day
- Monitor work progress

Safety

- Approve PTW
- Check LOTO
- Check divers and equipment
- Keep monitoring during diving

Tool Box Improvement

The Naval & Special Ship Business Unit engages in continuous efforts to identify gray zones under the pledge of “Our Commitments."

We conduct repeated inspections to ensure that the fatality accident safety measures established after the tool box explosion are being implemented, thereby keeping the improvement measures active. In addition, we engaged in rapid vertical deployment for similar accidents at other business units, with comprehensive inspections and improvement measures implemented for similar tool boxes.

Tool box inspection

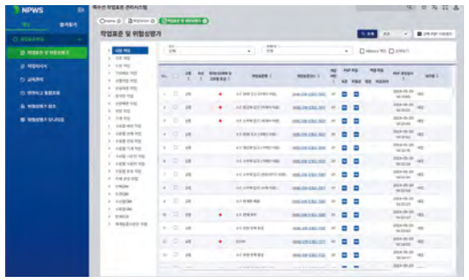
Improvement of Work Standards and the Risk Assessment System

Advancement of Work Standards and Periodic Risk Assessments

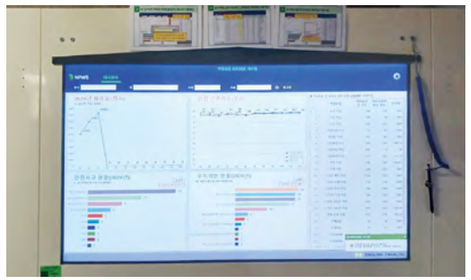
The Naval & Special Ship Business Unit has transitioned to a web-based work standard system for improved user convenience.

This development has not only improved visibility but also increased usage speed for faster information verification. Additionally, we have set up kiosks at the sites so that on-site workers can easily check work standards, enhancing accessibility and strengthening the usability of work standards and risk assessments.

Naval and special ship work standards, web version



On-site kiosks



Improvement and Streamlining of Work Standards Criteria

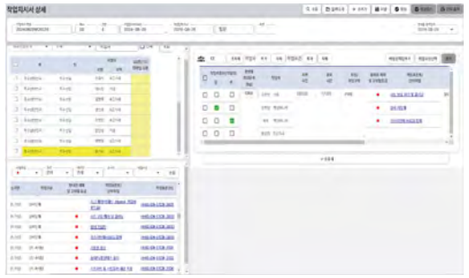
The Naval & Special Ship Business Unit maintains work standards through its own system as a defense industry entity, with a total of 5,223 registered work standards. We revised the major risk management criteria (10 points), which had been applied according to the unit’s internal standards, to apply the enterprise-wide standards (8 points). In addition, we thoroughly reviewed the work standards and classified them into used/unused work standards, classifying the unused work standards as inactive. Through this, each department can more efficiently manage work standards actually used on-site.

No.	작업분류	작업표준				
		전체	비활성화	제개정 합계	기존 개정	신규 제정
1	내업 작업	308	0	308	304	4
2	건조 작업	199	149	50	50	0
3	도장 작업	228	107	121	121	0
4	선행의장 작업	95	0	95	95	0
5	철의장 작업	292	104	188	186	2
6	기장배관 작업	349	0	348	348	0
⋮						
13	수중철 전장 작업	160	0	160	160	0
14	수중철 기계 작업	216	0	216	216	0
15	수상철 시운전 작업	456	0	456	456	0
	합계	5,223	653	4,125	4,116	9

Use of Safety Work Orders Based on Work Standards

The Naval & Special Ship Business Unit conducts on-site risk assessments during daily morning TBM activities. We conduct on-site risk assessments based on the naval and special ship work standard system. When work orders are issued, the risks of each work are communicated to workers via text messages. Supervisors notify workers of work risks along with daily work orders, and workers can check key management items for their work by conducting on-site risk assessments using the URL connected to the text messages. We improved the on-site risk assessments to work in conjunction with HD Safe Pay (August), which led to a gradual improvement of the on-site risk assessment implementation rate.

Naval & Special Ship work order system



Work order editing menu (administrator)

On-site risk assessment system

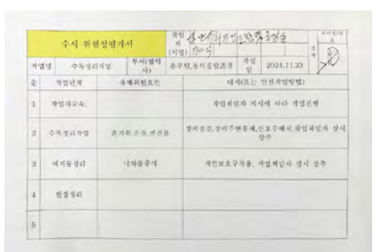
Mobile on-site risk assessment (worker)

Prior Risk Assessment for Non-routine / Short-term Works

The Naval & Special Ship Business Unit manages PTWs, ad-hoc risk assessments, and work orders as a package for preventing safety accidents during non-routine/short-term works. Non-routine/short-term works require focused management as they may vary depending on the work environment, and the three documents are posted and managed on-site when the work begins. The Navel & Special Ship Safety Section visits non-routine/short-term work sites to continuously monitor whether the required documents are posted and check work details and other matters.

- PTW
- Work plan
- Ad-hoc risk assessment

Non-routine work PTW



Ad-hoc risk assessment

Work orders

Support to Improve Safety and Health Levels of Subcontractors

Incentives for Subcontractors and Safety Managers with Outstanding Safety Performance

We provide technical guidance and level evaluations quarterly to improve the safety and health levels of in-house subcontractors, and grant incentives to honor subcontractors with outstanding performance. Subcontractor safety and health level evaluations are conducted on 5 evaluation items: safety leadership, system, culture, on-site management, and health. Then, we select an outstanding subcontractor to receive the reward in each half-year. In addition, through capability level evaluation of subcontractor safety managers, we select and honor safety managers with outstanding performance in Naval & Special Ship Business Unit safety activities and safety accident prevention once per half-year.

Half-year	Outstanding subcontractor
1H	Keumnong Industry
2H	Jinwoo Industry

Foreign Worker Safety Management

The Naval & Special Ship Business Unit conducts safety capability diagnosis and meetings for foreign (Filipino) workers once per half-year. Safety capability diagnosis is conducted using evaluation sheets in their native language to test their knowledge of safety matters that foreign workers must know in the workplace. Based on the results, items with poor diagnosis results are reflected in the curriculum and addressed through customized training during monthly regular safety and health training programs. In addition, through meetings, we hear the voices of foreign workers to collect safety-related opinions that need on-site improvement, which we support and address. The Naval & Special Ship Business Unit will continue to strive to create an environment where foreign colleagues working away from their home countries can work without safety accidents by strengthening foreign worker safety training.

Strengthening of Emergency Response and Traffic Safety

Emergency Evacuation Fire Drills

The emergency evacuation fire drills for the Naval & Special Ship Business Unit were conducted in November, and the unit conducts realistic emergency evacuation drills on a regular basis. The drills are conducted under a simulated fire scenario to train for overall firefighting activities to improve emergency response capabilities. We monitor each situation during the drills, and feedback from post-drill debriefing is reflected in the next drill.

Naval and Special Ship Emergency Evacuation Fire Drills in 2024

Classification	No.	Targets	Remarks
Vessels	4 times	PA31(2/7), P170(2/29), P171(9/13), 169(11/7)	
Buildings	1 time	Naval and Special Ship Management Building (11/15)	

Emergency evacuation fire drill at the Naval and Special Ship Management Building



Traffic Safety

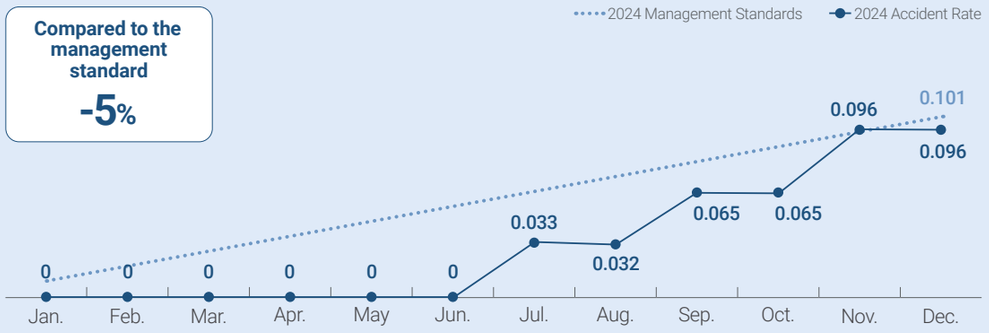
As part of preventing traffic accidents within the workplace, we carry out traffic enforcement and campaigns, including guidance and awareness-raising activities on a continuous basis. Since commuting safety is connected to workplace safety, we conduct traffic safety monitoring and enforce DUI rules to establish safety discipline. In addition, we conduct safety inspections for two-wheeled vehicles to guide and encourage workers to check safety device functions and conditions, such as headlights and taillights, to prepare against the winter season when the risk of traffic accidents increases during dark commuting hours.



Safety Management Achievements of the Engine & Machinery Business Unit in 2024

The main safety achievements of the Engine & Machinery Business Unit in 2024 are as follows:
First, we advanced the risk management system to establish the on-site risk management process. Risk assessments are conducted for all works, and risk factors are identified in advance through the newly introduced mobile safety work order system. We actively use TBM and other on-site risk assessments to thoroughly manage the implementation of safety procedures.
Second, we strengthened the operability of our subcontractors' safety systems to improve self-regulated safety management levels. We consolidated the systems for proactive, safe work standard management technical guidance and safety diagnosis of the three major ship engine production companies, including HD Hyundai Engine and HD Hyundai Marine Engine.
Third, we established an eco-friendly engine safety management system to advance gas and hazardous substance safety management. To that end, we developed and trained gas and hazardous substance safety management organizations and professionals, along with a system for periodic inspections and emergency response for facility safety management.

Compared to the management standard
-5%



Classification	2023	2024
Fatality accidents	0	0
Accidents (work-related)	4	3
Accident rate	0.139	0.096
Frequency rate*	0.686	0.462

* Based on 1 million working hours

Major Achievements of the Engine & Machinery Safety Department in 2024

Detailed Action Plan	Implementation Methods	Major Achievements
Advancing Hi-Standard-based work standards/ periodic risk assessments	**Enhancing Hi-Standard in periodic risk assessments**	
	Ensuring that past accidents are reflected	1H) Checked incorporation progress of lessons from 12 major accidents (61 incorporated / 61 inspected) 2H) Checked incorporation progress of lessons from 8 major accidents (23 incorporated / 23 inspected)
	Establishing residual risk management measures	Completed feedback on 84 high risk work standards
	Selecting major hazards and improving underlying risks	Created countermeasures to address the root causes of 8 major accidents at the business unit over the past 10 years (measures established for 3 cases / 3 target cases)
	Adding health hazard assessments	Completed evaluation of health hazards such as respiratory, hearing, and vibration hazards for each work (1,436 reviewed)
Establishing an ad-hoc risk assessment system based on ESP	**Advancing risk assessment for occasional, non-routine, and out-of-flow operations**	
	Performing an ad-hoc risk assessment of non-routine / out-of-flow operations	Completed ad-hoc risk assessment for all non-routine work conducted in the unit (135 assessed / 135 targets)
	Ensuring thorough verification of ad-hoc risk assessment results by persons in charge of production and safety	Conducted complete inspection of risk assessment to develop a high risk work inspection system (712 confirmed / 712 targets)
	Developing and using checklists specialized for ad-hoc risk assessment	
Activating on-site risk assessment based on the mobile safety work order system	**Establishing a worker-centered culture of on-site risk assessment**	
	Expanding on-site risk assessments using mobile safety work orders	Continuously checked mobile safety work order confirmation rate (maintaining over 80% confirmation)
	Evaluating the use of mobile safety work orders and establishing a rewards system	Reflected the mobile safety work order confirmation rate in the 1H subcontractor safety management level evaluation
Conducting training and promotions to encourage risk assessment	**Enhancing safety management for safety-vulnerable employees**	
	Conducting on-site risk assessment briefings using mobile safe work systems	Distributed materials on on-site risk assessment methods using the mobile safety work system for production/subcontractors
	Performing specialized training and distribution of materials to promote risk assessment	Conducted risk assessment education for subcontractor safety managers and distributed materials to all departments
	Conducting technical guidance and evaluation of risk assessment systems of subcontractors	Conducted technical guidance and evaluation of risk assessment systems during subcontractor safety management level evaluations (completed quarterly technical guidance and evaluation for 20 subcontractors)
Advancing the triple safety management system for high risk works	**Strengthening the operability of QR-based high risk safety management systems**	
	Conducting P-D-C-A operability monitoring for high risk safety management	Monitored high risk work in real-time using the Meta-EMD high risk work monitoring system (currently monitoring around 100 works per day)
	Conducting validity reviews for critical high risk works	Continuously reviewed works subject to high risk work inspection (total 273 target standards, 180 department autonomous inspections, 93 triple inspections)
	Strengthening safety management in conjunction with PTWs	
	Thoroughly conducting triple safety inspections for PTW-targeted work	Developed and currently utilizing a work standard-based high risk work inspection system (registering and inspecting around works subject to 50 triple inspections daily)
	Thoroughly monitoring the use of the PTW-linked triple safety inspection management system	Developed and currently utilizing a work standard-based high risk work inspection system (maintaining inspection rate above 90%)
Establishing a self-regulated safety organization led by the production departments	**Promoting safety activities based on employee communication**	
	Listening to workers' opinions and providing feedback through meetings with production and safety departments	Held monthly production-safety meetings and provided feedback on employee opinions (64 cases / 64 targets)
	Implementing safety improvements in production departments (including subcontractors, meeting agenda)	Subcontractor-specific improvement tasks (2 tasks/month) (180 improvements / 180 targets)
	Strengthening gas and hazardous substances management organizations and professionals	
	Developing gas safety professionals through training organizations	Gas safety manager training (Korea Gas Safety Corporation) - 1 trainee completed training in March, followed by another trainee in May, and 2 trainees on November 2
	Enhancing gas and hazardous substances management capabilities through expert engagement	On-site inspections with gas/hazardous substance experts and technical advisors (1 time/2 weeks)
	Establishing eco-friendly engine management and contingency planning systems	
	Thorough change management for non-routine works	Conducted risk assessment with the safety department when installing and maintaining methanol/ammonia engine-related facilities (non-routine work) before work starts
	Establishing an integrated monitoring system for control room (ICC) separation and eco-friendly engines	The eco-friendly integrated engine monitoring system, ICC, scheduled for completion in January 2025
	Operating emergency response systems for vulnerable areas, such as eco-friendly facilities and underground viewing pits	July: Conducted an ammonia-related joint departmental leakage emergency response drill (disaster prevention, emergency evacuation, patient transport, etc.) October: Conducted an ammonia leakage emergency evacuation drill at the Engine Technology Center (Engine Development and Test Department)

Advancement of Hi-STANDARD-based Work Standards / Periodic Risk Assessments

Implementation of Meaningful Periodic Risk Assessments

Hi-STANDARD Residual Risk Management

The Engine & Machinery Business Unit conducted periodic risk assessments for a total of 1,488 work standards, and established 68 major risk special reduction measures and conducted training for major risk factors including the operations where accidents occurred.

Division/Department		Major Risk Assessment Items
Safe Production	Material Processing	(Casting) propeller pouring, (Melting) melting furnace sintering and ladle brick laying, etc.
	Commissioning 1	(Mechanical Commissioning) Factory commissioning pre/post crank chamber inspection, (Final Assembly) opening inspection, etc.
	Commissioning 2	(Final assembly) Stay bolt assembly/disassembly, (Final Assembly) bed plate assembly/disassembly, etc.
	Production Technology	(Auxiliary Engine Shop) - Ammonia bunkering, methanol supply facility operation, etc.
Design	Engine Development and Test Department	(Commissioning) Ammonia engine commissioning, (Assembly) exhaust pipe disassembly and assembly, etc.

Identification of Hidden Risks and Improvements to Address Fundamental Risks

Every other month, we provide 20 incentives to direct and in-house subcontractor employees (Korean and foreign) who contributed to improvements addressing fundamental risks. At the end of each year, we select the top 6 improvements and grant KRW 300,000 to each employee as internal rewards in the safety and production sector. A total budget of KRW 5.8 million has been set aside for 10 HD HHI departments with 1,020 employees and 18 subcontractor departments with 1,358 employees to continuously improve individual safety awareness.

Hidden risk finding/improvement award ceremony for the safety and production sector

Division/Department		Cases of Hidden Risk Finding/Improvement
Safe Production	Material Processing	(Casting) 11 cases including improvement of overflow clay pipe storage instability causing falling and injuries
	Commissioning 1, 2	(Commissioning Department 1) Improvement of jacket block twisting during hoisting for air cooler assembly
		(Commissioning Department 3) 21 cases including prevention of caught-under accidents through wedge plate production improvement
	Production Technology	(Commissioning Facilities) 12 cases including improvement of methanol supply facility tank upper PV valves
Purchased materials	Materials	(Materials Operation) Prevention of T/C lashing point overturning and 1 other

Hidden risk finding/improvements in 2024 (major cases)

Establishment of an Ad-hoc Risk Assessment System Based on Enterprise Safety Planning (ESP)

Advancement of Risk Assessment for Occasional, Non-routine, and Out-of-flow Operations

Non-routine/Non-flow Ad-hoc Risk Assessment

During the 1H of the year, 160 risk assessments were conducted for non-routine work, with an additional 62 conducted in 2H. For short-term work and other non-routine and non-flow works, the Engine & Machinery Safety Department closely reviews key safety items with workers to facilitate safe work progress.

Ad-hoc Risk Assessment (Non-routine Works)

Thorough Verification of Ad-hoc Risk Assessment Results by Persons in Charge of Production and Safety

We conduct TBMs before work and review the pre-submitted risk assessment reports. During work, we monitor whether the pre-agreed safety and health measures are strictly observed. If any deficiency is identified, we stop the work without exception and provide guidance and safety measures before resuming work.

Ad-hoc Risk Assessment (Ammonia bunkering)

Use of Checklists Specialized for Ad-hoc Risk Assessments

The Engine & Machinery Business Unit establishes plans for major safety inspection items and conducts weekly inspections based on a separate checklist, providing feedback on results to production organizations. In 2024, we conducted a total of 42 weekly inspections, and the production sector addressed the deficiencies found during inspections without delay to prevent similar issues on a continuous basis.

Checklist - Electrical Distribution Panel Inspection [for Engine & Machinery Safety Department weekly focus inspection]

전기분전반 점검(분전반: 440V/220V)
1) 조립2-2공장, 2) 대형내자2창고, 3) 통합정비과
4)2공장 FGSS 5) 대형엔진글고도장장

결재	팀 장	과 장

▣ 점검 POINT (분전반)

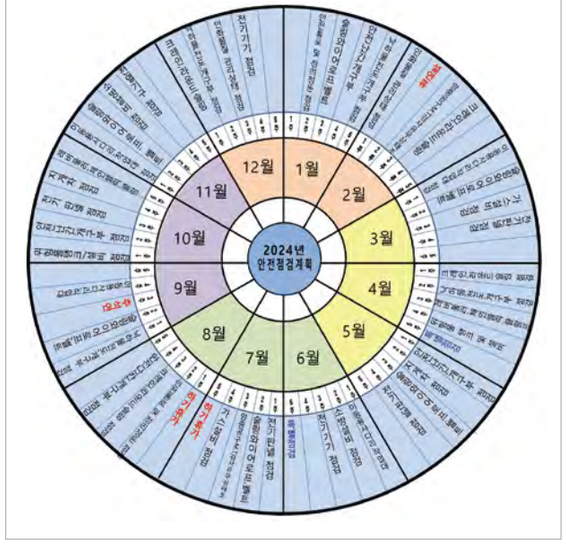
① 접지 설치상태(도어,중판,내부접지 등)
② 외함 및 DOOR 상태(손잡이 변형 등)
③ 분전반 내부 절연파괴(충전부 노출 등)
④ 누전차단기 정상 작동 여부
⑤ 분전반 내부 청결상태
⑥ 분전반 주변 자재적치 유무
⑦ 분전반 내부 콘센트등 파손여부
⑧ 분전반 월1회 이상 점검 여부 (보전부/담당부서)
⑨ 기타 (표시물 부착상태 등)

※ 점검시 생산/모던설비 구별 점검

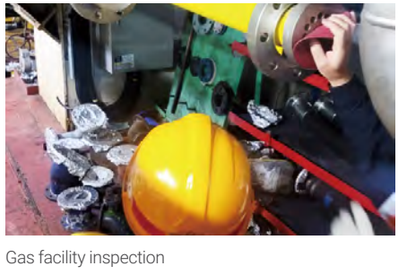
점검자: 점검기간 : 2024 . . . 2024 . . .

NO	부서명	장소	분전반				불량내용	비고 (조치내용)
			440V		220V			
			점검 수량	불량 수량	점검 수량	불량 수량		
1								

2024 safety inspection calendar and inspection photos



Forklift inspection



Gas facility inspection

Activation of On-Site Risk Assessment Based on the Mobile Safety Work Order System

Establishment of a Worker-Centered Culture of On-site Risk Assessment

The Engine & Machinery Business Unit has developed the Meta-EMD system by applying smart factory technology for factory and process visualization. Through this, safety and production organizations can check major safety indicators and processes that need management in real time, enhancing their ability to preemptively recognize safety risks and more efficiently monitor them.

High risk work triple inspection safety management based on work standards

[Triple Inspection] All works | High risk work requiring double inspection | High risk work requiring triple inspection

Work Standards

Department A
Department B
⋮
Department F

- Completed classification of inspection levels for all Engine & Machinery Business Unit work standards

Mobile Safety Work Orders

Automatic classification of inspection level (double/triple) when attaching work standards related to the day's work in mobile safety work orders

High Risk Work Inspection

- Access the inspection menu **on mobile** using the same QR code for **inspection**
- **Check target works and the inspection status by factory**
- **Monitor inspection status using META-EMD**

Meta-EMD High Risk Work Monitoring System

Meta-EMD: Meta (meaning meta, abstract) + EMD (Engine Machinery Division) referring to Engine & Machinery Business Unit
We built an environment that enables recognition of the risk factors of each process by visualizing the current factory situation.
It shares reliable information based on the matching of physical objects and information, and provides real-time safety indicators based on data, thereby enabling high risk work monitoring.

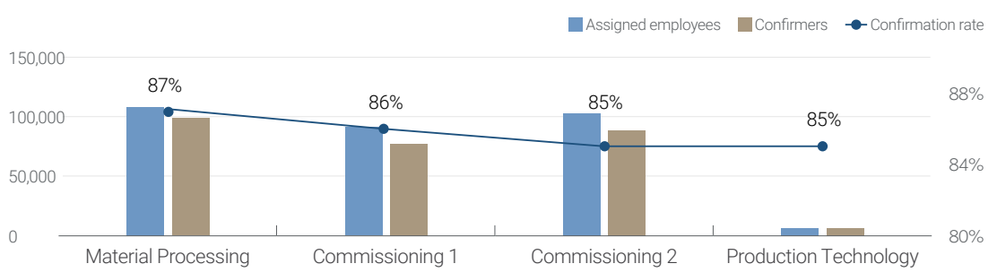
Identification of Best Practices in On-site Risk Assessment

Classification		Best Practice Video and Promotion
TBM personal statements	Awareness of major risk factors and sharing of hidden risk factors	
Mobile safety work orders	Prior review of major risk factors by checking the translated mobile safety work orders	
Pointing and calling	Reaffirm major risk factors through pointing and calling before work	

Expansion of On-site Risk Assessments Using Mobile Safety Work Orders

To achieve early entrenchment of the mobile safety work order system introduced in 2024, we created and distributed the related documents while continuously monitoring work orders and confirmation rates. In particular, for high risk works, supervisors checked the status of work order issuance through mobile and PC, and workers were continuously monitored to ensure thorough implementation of same-day instruction confirmation and on-site risk assessment of major risk points. Thanks to these efforts, we achieved a high instruction confirmation rate through the mobile safety work order system.

2024 mobile safety work order confirmation rate (cumulative, from January 1 to November 5)



Training and Campaigns to Promote Risk Assessment

Strengthening of Safety Management for Safety-vulnerable Employees

The number of foreign workers in the Engine & Machinery Business Unit increased by 87% from 221 in March 2023 to 415 in October 2024. Accordingly, we strengthened various safety activities for foreign workers, who are vulnerable to various safety issues.

Specialized Training and Distribution of Materials to Promote Risk Assessment

We created educational materials and distributed them to help foreign managers fully understand risk assessment (periodic, ad-hoc, on-site) and provide appropriate work orders. We distributed manuals on TBM and pointing confirmation procedures in various languages to facilitate risk assessment on-site. In-house subcontractors held worker meetings on a regular basis and used teaching materials to improve foreign workers' understanding of risk assessment, TBM, and pointing and calling.

Technical Guidance/Evaluation of Subcontractor Risk Assessment Systems

We conduct safety technology exchanges on a regular basis for safety technology exchange between the three major ship engine sites (HD HHI Engine & Machinery Business Unit, HD Hyundai Marine Engine, and HD Hyundai Engine). Through these efforts, we minimize the legal risks of affiliates by sharing various know-how such as HD HHI's safety management system (including risk assessment system), on-site safety management, response to the Serious Accidents Punishment Act, and suggesting improvements.

Classification	HD현대중공업 엔진기계사업부	HD현대엔진	HD현대마린엔진
Safety Rules	10 Safety Golden Rules, 10 Major Safety Rules in effect	HD HHI's 10 Safety Golden Rules currently in effect	5 Safety Rules (PPEs, smoking, speed violation, mobile phone, PTW)
Safety Work Orders	Mobile safety work order programs	HD HHI mobile safety work order programs	Work orders for heavy objects and forklifts (some improvement needed)
Work Standards	Hi-Standard in operation with 1,339 standards in the Engine & Machinery Business Unit	Work standards and risk assessments managed separately	Work standards and risk assessments managed separately
High Risk Work Inspection	Enhancement in progress for triple inspection for high risk works (supervisor + Safe Clover + safety supervisor)	**Need to systematically classify high risk works and improve the management system**	**Need to systematically classify high risk works and improve the management system**
PTW	On-site, face-to-face, computerized permits (fire, electrical, confined spaces, commissioning, etc.)	Limited PTW system operation to non-routine works (need to consider applying the PTW system to the main processes)	Operated the PTW system (general, power outage, working at heights, fire, confined spaces, etc.)

Job-specific Work Standard Training Videos for Foreign Workers

We created site-specific work standards and risk assessment video training materials for foreign workers, contributing to job commitment and strengthening hazard identification and safe work capabilities for each job.
In 2024 1H, we completed a total of 21 work videos including those on blower motor cable wiring and dismantling. In 2H, we developed scenarios in languages spoken by foreign workers for a total of 10 standard operations including HiMSEN engine commissioning to improve their understanding of on-site risk assessment items.

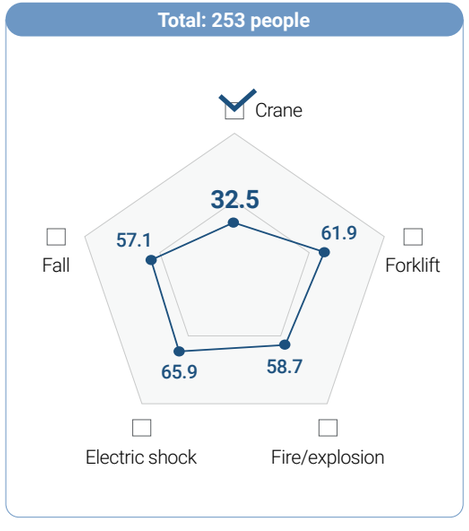
Korean Speaking Contest and Global Korean Safety Quiz Contest

The Engine & Machinery Business Unit, in collaboration with in-house subcontractors, holds Korean speaking contests to provide incentives to foreign workers with outstanding Korean proficiency. In 2024 2H, 68 foreign workers from in-house subcontractors (4 from each subcontractor) participated in the "2024 2nd Global Korean Safety Quiz Contest" to test their Korean language proficiency and safety knowledge, which has become an important venue for motivating foreign workers to improve their Korean skills.

Safety Capability Level Diagnosis for Foreign Workers

To assess the safety capabilities of in-house foreign workers, identify deficient areas, and strengthen safety capabilities through customized education, the Engine & Machinery Business Unit conducted mobile diagnostics across multiple difficulty levels on major safety items such as cranes, fire/explosion, electric shock, falls, and forklifts. The diagnosis was joined by 253 out of 468 foreign workers (54%) from 6 major countries. Based on the diagnostic results, the ISTC is providing customized training for each risk factor.

LEVEL 1	LEVEL 2
Unable to measure safety capabilities	Measure ability to recognize on-site risk factors
Risk	**Interest**
Customized training based on capability diagnosis results (Completed the Step 1 training at the ISTC)	
LEVEL 3	**LEVEL 4**
Measure basic safety knowledge needed for on-site work	Measure specialized/ advanced safety knowledge
Good	**Excellent**
Continue monitoring safe work performance	Difficulty adjusted according to LEVEL 3 correct answer rate



Advancement of the Triple Safety Management System for High Risk Works

Strengthening of the Operability of QR-based Safety Management Systems for High Risk Works

The Engine & Machinery Business Unit has reviewed all work standards and reclassified high risk work into 180 items for double inspection and 93 items for triple inspection. Items that need improvement in the high risk work inspection process are collected through a VOC process, and based on the results, we create operation manuals to facilitate meaningful inspections.

① Scan the QR code
② Select inspection location
※ Set the factory to inspect when accessing the system for the first time (In-shop workplace → connect to Engine & Machinery)

③ Select inspection work
④ Select inspection entity and conduct inspection
※ Please contact the safety department if the high risk work standards/inspection checklists need modification.

Strengthening of Safety Management in Conjunction with PTWs

After commissioning eco-friendly fuel engines, methanol line dismantling work, replacement work of methanol-related equipment and parts that may involve risk of mass exposure, and all work involving risk of ammonia exposure have been added to the PTW-requiring works for management. These works are thoroughly managed through inspections by three entities—supervisors, Safe Clover, and safety supervisors—and their progress is shared in real time.

Establishment of a Self-Regulated Safety Organization Led by the Production Departments

Promotion of Safety Activities based on Employee Communication

Safety and Production Section Safety Meetings and Subcontractor Safety and Health Committee

We hold monthly safety meetings between safety and production departments to select key agendas from production departments and conduct in-depth discussions on safety works. Each agenda is discussed in brainstorming sessions to identify and share improvements with the relevant departments. In addition, the Subcontractor Safety and Health Committee convenes for meetings with in-house subcontractors, where the safety department shares safety systems, major on-site risk matters, and outstanding improvements, while subcontractors present their own safety management status and cases of on-site safety improvements, with incentives given to subcontractors with outstanding safety performance.

Divisional Safety Council Meetings

Subcontractor Safety and Health Committee

Subcontractor Safety Manager Meetings

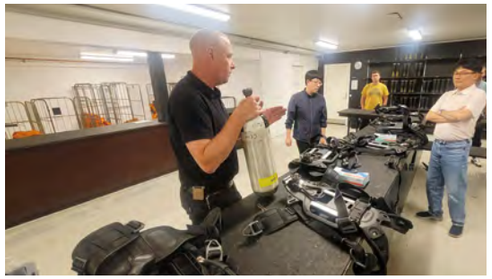
We hold subcontractor safety manager meetings on a monthly basis to listen to challenges on-site and conduct in-depth discussions on measures to address them. Through this, we examine improvements tailored to each subcontractor's situation, horizontally deploy best practices, and share them among in-house subcontractors. In addition, the latest safety policies and issues are shared and instructed to strengthen subcontractor safety managers' capabilities, actively supporting safety management capability improvement.

Strengthening of Gas and Hazardous Substance Management Organizations and Professionals

Development of Gas Safety Professionals Through Training Organizations

We conducted specialized ammonia training for the safe operation of newly built ammonia facilities and ammonia engines in 2024. First, through facility tours and meetings with the licensor MAN-ES, the participants learned about safety devices and emergency response measures inside and outside the RCC. They held in-depth discussions on the operation method of water curtains at bunkering stations and how to apply them in-house. In addition, by completing the “Ammonia Safety Course” at RelyOn Nutec, a safety professional training institution located in Esbjerg, Denmark, participants were able to thoroughly understand emergency response practices and appropriate relief measures in case of ammonia leakage.

* RelyOn Nutec: A global safety education professional institution established around 50 years ago for the purpose of safety education for personnel operating oil/gas facilities produced in the North Sea. The institution currently manages more than 30 training centers in 22 countries including its headquarters in Copenhagen, Denmark.



Enhancement of Gas and Hazardous Substances Management Capabilities Through Expert Engagement

We minimize Safety risk factors due to increasing eco-friendly engine facilities through on-site inspections with the participation of in-house gas/hazardous substance technical advisors and production and safety departments. Including on-site inspections and equipment document reviews, various types of support are provided to enable workers to perform gas/hazardous substances-related duties within the business unit to facilitate their work performance. We make continued efforts to train gas/hazardous substance specialists through training conducted by external specialized institutions every year.

Establishment of Eco-Friendly Engine Management and Contingency Planning Systems

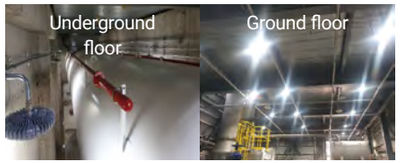
Operation of Emergency Response Systems for Vulnerable Areas Including Eco-Friendly Facilities and Underground Viewing Pits

We conducted comprehensive response drills in preparation for leakage accidents that may occur during the operation of ammonia supply facilities.

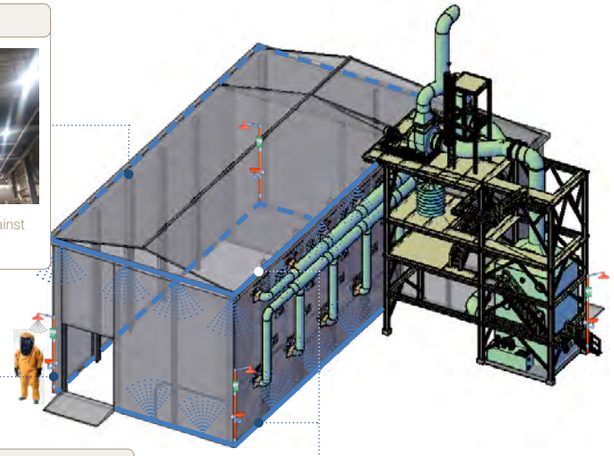
By conducting a drill that simulated damage to the front protrusion of the buried ammonia pipeline, we simulated various real-world situations, including facility shutdown, accident notification, emergency reporting, emergency evacuation, and ammonia spread control, and thorough preparations are being made for potential emergency situations.

Ammonia engine disaster prevention facilities

Sprinkler system inside the facility building



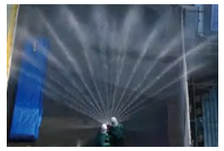
- Sprinkler system inside the facility building to prepare against large gas leaks and fires



Shower facilities around the facility building

- Booth-type/open-type shower facilities for ammonia removal → Patient face masks (+filters) available

Water curtain outside the facility building



- Water curtain constructed at the top and bottom of the facility building to block external leakage of gas in case of ammonia leakage

Culinary Class Wars: Why the Runner-up Shined More

The Importance of Words and Attitudes

The program that created the largest buzz in the second half of 2024 was undoubtedly Culinary Class Wars. This program, aired in 12 episodes, is a survival culinary show in which 80 "black spoon" chefs and 20 renowned "white spoon" chefs compete in various contests. With two judges of different styles, a class system (famous/unknown), fresh missions, and the plot twist of unknown skilled chefs eliminating famous chefs, it offered great entertainment. After the show ended, the runner-up, Edward Lee, received more attention than the winner, being hailed as the de facto winner of the competition.

The winner, Chef Kwon Seong-joon (Napoli Matfia), posted an apology before he could even enjoy the pleasure of winning due to hasty and arrogant remarks like “grinding him down…" and participant Chef Seonkyoung Longest also became the subject of criticism as issues were raised about her personality and attitude due to her profanity and joking tone.

Chef Edward Lee showed a humble and respectful demeanor, and even the stories that he associated with his dishes sincerely conveyed his philosophy toward life, which contrasted with the attitude of the final winner and connected with viewers as being more sincere.

According to the Law of Mehrabian, 93% of communication factors are non-verbal (facial expressions, posture, manners, gestures, speech speed, intonation, etc.), while verbal factors (words, vocabulary, content, etc.) only account for around 7%.

In safety communication for correcting (changing) unsafe worker behavior, words and attitudes are very important. In particular, to convey sincerity, while the content of the conversation is important, non-verbal messages should also be carefully considered.

We particularly stress safety inspections based on the 4S rule (Stop-Stay-See-Say) for high risk works, while emphasizing supervisors' practices. In particular, efforts are needed to pay careful attention to words and attitudes in the final stage of 4S, which is dialogue (Say), to help workers take safe actions.

PART. 5

Safety and Health Management Plan

HD HYUNDAI
HEAVY INDUSTRIES

5-1 Management Plan of the Corporate Safety Department / Corporate Safety and Health Support Department for 2025

We at the Corporate Safety Department and the Corporate Safety and Health Support Department will systematically implement key initiatives according to the Safety Vision 2027 mid-to-long-term roadmap, focusing enterprise-wide capabilities on establishing safe workplaces with zero fatality accidents.

SAFETY
HEALTH

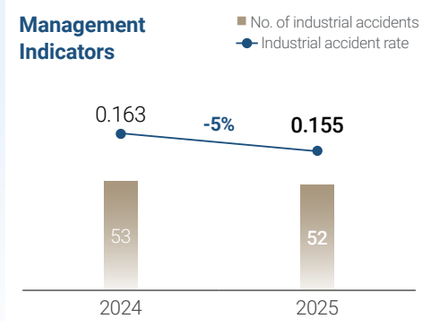
Objectives of the Corporate Safety Department / Corporate Safety and Health Support Department for 2025

Corporate Safety Department / Corporate Safety and Health Support Department

Objective

- ZERO fatality accidents
- Industrial Accident Rate of 0.155 or less

Management Indicators



Implementation Plan	Vision 2027
• Improving risk assessment operability	System
• Linking safety integrated monitoring systems	System
• Expanding subcontractor total solutions	System
• Improving safety culture diagnosis	Culture
• Developing customized safety education curriculum	Culture
• Advancing the SCP	Culture
• Improving accident prediction system reliability	Technology
• Enhancing intelligent control system object detection functions	Technology

Detailed Implementation Plan for Achieving 2025 Safety, Health, and Environment Management Goals

Safety Planning Section

Detailed Action Plan	Implementation Methods	Q1			Q2			Q3			Q4		
		1	2	3	4	5	6	7	8	9	10	11	12
Advancing Hi-SEs-based work standard / risk assessment	**VISION** Promoting safety and health activities based on risk assessment												
	Operating (periodic) risk assessments		Training	Periodic	Periodic	Periodic	Reporting		Training	Periodic	Periodic	Periodic	Reporting
	Advancing periodic/ad-hoc/on-site risk assessment system (system linkage)	Planning	Planning	Planning	Construction	Construction	Construction	Construction	Construction	Construction	Training/ Promotion	Training/ Promotion	Training/ Promotion
	Establishing risk assessment Audit system and processes	Planning	Planning	Planning	Construction	Construction	Construction	Construction	Construction	Construction	Application	Application	Application
Enhancing the Usability of the Integrated HSE Management Computerized System	Proceeding with the 4th advancement of Hi-SEs (Phases 2 and 3)												
	Developing health/safety support menus (Phase 2) and proceeding with Phase 1 maintenance	■	■	■	■	■	■	■	■	■	■	■	■
	Developing and stabilizing existing/new environment and monitoring menus (Phase 3)	■	■	■	■	■	■	■	■	■	■	■	■
	VISION Integrating enterprise-wide high risk work management system												
	Integrating high risk work inspection inputs and displaying them in the integrated safety dashboard	■	■	■	■	■	■	■	■	■	■	■	■
Establishing a subcontractor safety certification system	Implementing the subcontractor safety certification system												
	Planning a subcontractor safety certification system and implementing safety certification	■	■	■	■	■	■						■
Establishing a system diagnosis framework	**VISION** Developing system diagnosis tools												
	Developing system diagnosis tools and establishing enterprise-wide evaluation system	■	■	■	■	■	■	■	■	■	■	■	■
	Establishing an integrated safety and health management system												
	Establishing an integrated safety and health management system (ISO, Serious Accidents Punishment Act, in-house standards unification)	■	■	■	■	■	■	■	■	■	■	■	■
Operations/ General	Corporate Safety and Health Office Operations/General												
	Operating Safety Strategy Workshops (June/ December)						■						■
	Establishing and monitoring divisions budget	■	■	■	■	■	■	■	■	■	■	■	■
	Enterprise-wide management meeting (once a week), safety management meeting (once a month), safety council of the three shipbuilders	■	■	■	■	■	■	■	■	■	■	■	■
	Committee operation: Safety Management Committee (semiannual), Safety Innovation Advisory Committee (general meeting once a year, quarterly)			■		■	■	■		■		■	■
	Conducting inspection under the Serious Accidents Punishment Act and inspection on the responsible management personnel's safety and health obligations						■						■
	Completing ISO 45001 renewal assessment	■	■	■	■	■							
	Calculating accident statistics (weekly statistics, monthly statistics)	■	■	■	■	■	■	■	■	■	■	■	■
	Publishing the 2025 Safety and Health Management Plan	■	■	■	■	■	■	■				■	■

Safety Culture Section

Detailed Action Plan	Implementation Methods	Q1			Q2			Q3			Q4		
		1	2	3	4	5	6	7	8	9	10	11	12
Continuing the implementation of the integrated safety culture diagnosis program	**VISION** Safety awareness survey												
	Conducting once a year	■ Conducting											
	Preparing departmental improvement plans			■									
	Registering departmental improvement performance results						■			■			■
	VISION Competency assessment												
	Implementing the assessment as part of the safety training course	■	■	■	■	■	■	■	■	■	■	■	■
Operating customized safety education programs	**VISION** Advancing the career paths												
	Launching supervisor phased education programs		■	■	■	■	■	■	■	■	■	■	■
	Launching and operating advanced practical/ experiential risk assessment training course	■	■	■	■	■	■	■	■	■	■	■	■
	Continue operation of phased training programs for foreign worker	■	■	■	■	■	■	■	■	■	■	■	■
	Improving safety division SCP-S courses	■	■	■	■	■	■	■	■	■	■	■	■
	Advancing in-house equipment qualification training												
	Standardizing acquisition training curriculum		■										
	Continuing implementation of integrated refresher training	■	■	■	■	■	■	■	■	■	■	■	■
Developing and using effective safety contents	**VISION** Advancing VR safety training												
	Creating realistic VR content in group mission performance format				■	■	■	■	■	■	■	■	■
	Setting up VR experience facilities to improve training effects				■	■	■						
	VISION Setting up Safety Notices												
	Setting up posts with new designs in the required zones					■						■	
	VISION Creating video safety and health training programs												
	Creating new types of training videos in advance to draw trainees' attention	■	■	■	■	■	■	■	■	■	■	■	■
	VISION Creating job-specific safety videos												
	Creating job-specific safety videos to draw trainees' attention, including foreign worker versions	■	■	■	■	■	■	■	■	■	■	■	■
	VISION Creating safety short-form videos												
	Producing safety short form videos	■	■	■	■	■	■	■	■	■	■	■	■
	Increasing the view counts of in-house YouTube videos	■	■	■	■	■	■	■	■	■	■	■	■

Safety Risk Management (SRM) Section

Detailed Action Plan	Implementation Methods	Q1			Q2			Q3			Q4		
		1	2	3	4	5	6	7	8	9	10	11	12
Enterprise-wide risk finding and safety improvement	**VISION** Enterprise-wide Safety Improvement Activities (Hi-SAFE)												
	Selecting safety improvement tasks across organizations in the company	■	■	■									
	Result announcement - 1H / 2H			■	■	■	■	■	■	■	■		
	Holding a safety project contest / safety award ceremony										■		
	VISION Safety Risk Contest												
	Conducting a safety risk contest and rewarding excellent ideas			■									
	Holding job-specific worker improvement meetings				■	■	■	■					
	Deploying outstanding SRM works enterprise-wide and monitoring relevant department status				■	■	■	■	■	■	■	■	■
	VISION Safety Open Market (SOM)												
	Registering SOM improvement tasks and manage operations	■	■	■	■	■	■	■	■	■	■	■	■
	Rewarding the best ideas and applying them to sites for safety improvements					■						■	
	VISION Safety-Production Deliberation Committee												
	Identifying, drafting, and deliberating agenda items (quarterly)		■			■			■			■	
	Implementing deliberated/adopted resolutions / managing improvement status					■					■		
	VISION Site Safety Improvement												
	Expanding the targets of the In-Shop Factory Environment Improvement Task Force (2025 targets: 6 factories in Shipbuilding, Offshore, Naval & Special Ship)	■	■	■	■	■	■	■	■	■	■	■	■
	Holding Mobile Heavy Equipment Accident Prevention Task Force meetings (agendas: safety device standardization and system improvement)	■	■	■	■	■	■	■	■	■	■	■	■
	Holding Work Facility Safety Enhancement Task Force meetings (agendas: safety production standards and improvement of aging facilities)	■	■	■	■	■	■	■	■	■	■	■	■
	Holding Hoisting Tool Safety Enhancement Task Force meetings (agenda: non-destructive testing and usage standards improvement)	■	■	■	■	■	■	■	■	■	■	■	■
	Continuing to strengthen the safety of three safety facilities (focus on improved ventilation in in-shop factories)	■	■	■	■	■	■	■	■	■	■	■	■
	Continuing to improve on-site safety facilities and work methods	■	■	■	■	■	■	■	■	■	■	■	■
Advancing big data-based safety management systems	**VISION** Accident prediction system advancement												
	Analyzing and predicting accidents through safety data interconnection	■	■	■	■	■	■	■	■	■	■	■	■
	Developing generative safety risk warning service (1st development) (work safety standard answers, foreign language translation, daily precaution notifications)						■						
	Establishing linkage between Hi-CAMs risk detection data and safety prediction system						■						
Implementing an AI-based safety monitoring system	**VISION** Enhancing object detection and control												
	Improving small object detection and expanded control capabilities (e.g., presence of fall protection, safety golden rules violations, G/C collision control, etc.)	■	■	■	■	■	■	■	■	■	■	■	■
	VISION Sensor data-based Hi-CAMS integration												
	Promoting database development linked with in-shop factory work/environment sensing data (1st development)	■	■	■	■	■	■	■	■	■	■	■	■

Detailed Action Plan	Implementation Methods	Q1			Q2			Q3			Q4		
		1	2	3	4	5	6	7	8	9	10	11	12
	VISION Developing a safety big data linkage system												
	Developing a safety big data linkage system and deriving big data on Hi-CAMs									■			
Technology Commercial-ization Promotion (VISION 2027)	**VISION** Holding on-site safety improvement exhibitions												
	On-site safety improvement product exhibition (inhouse/external promotion) and patent application						■					■	
	Selecting product groups for external organization promotion (3 groups)						■						
	VISION Configuring packaging models specialized for each Hi-CAMs function												
	Product configuration tailored to specific functions such as fire (fire risk area), crane (hoisting safety), confined space (entry safety), etc.						■						

Safety Inspection Section

Detailed Action Plan	Implementation Methods	Q1			Q2			Q3			Q4		
		1	2	3	4	5	6	7	8	9	10	11	12
Establishing a self-regulated safety organization led by the production departments	**VISION** Conducting high risk safety diagnosis based on risk assessments												
	• Establishing quarterly safety inspection plans based on major accidents over the past 5 years • Analyzing and improving risk assessments • Implementing major accident recurrence prevention measures and reviewing/improving their effectiveness • Inspecting and improving unsafe conditions in gray zones • Inspecting and improving compliance with job standards / safety rules	■	■	■	■	■	■	■	■	■	■	■	■
	Engaging in special safety diagnosis activities (safety alert issuance organizations, post-accident special diagnoses, etc.)	■	■	■	■	■	■	■	■	■	■	■	■
	Providing safety feedback for risk assessments	■	■	■	■	■	■	■	■	■	■	■	■
	VISION Conducting compliance inspection of safety and health-related laws and regulations												
	• Conducting safety and health-related laws and regulations inspection (semiannually) • Inspecting/remedying non-compliance with safety and health-related laws and regulations • Improving the compliance rate with related laws through periodic guidance to on-site organizations		■	■	■	■			■	■	■	■	
Establishing a full package safety management support program for subcontractors	**VISION** In-house subcontractor / safety manager safety level assessments												
	Conducting in-house subcontractor safety level assessments (quarterly)	■			■			■			■		
	Conducting in-house subcontractor safety manager level assessments (semiannually)	■						■					
	VISION In-house subcontractor safety coaching program												
	Implementing a safety coaching program for newly registered in-house subcontractors	■	■	■	■	■	■	■	■	■	■	■	■
	Holding periodic meetings with subcontractors' safety management agencies (quarterly)		■			■			■			■	
	• Periodic safety technical inspection for subcontractors (due diligence) • Targets: production/support in-house subcontractors with assessment ratings of "average" or lower	■	■	■	■	■	■	■	■	■	■	■	■

Detailed Action Plan	Implementation Methods	Q1			Q2			Q3			Q4		
		1	2	3	4	5	6	7	8	9	10	11	12
	VISION Safety technical support program for external subcontractors												
	Total solution safety technical support program for external sub-contractors (40 companies)	■	■	■	■	■	■	■	■	■	■	■	■
	Safety technical guidance program for external subcontractors with less than 50 employees (20 companies)	■	■	■	■	■	■	■	■	■	■	■	■

Safety Supporting Section

Detailed Action Plan	Implementation Methods	Q1			Q2			Q3			Q4		
		1	2	3	4	5	6	7	8	9	10	11	12
Enhancing safety management execution through proactive management of legal risks	**VISION** Establishing an internal and external response work process												
	Establishing a response work process	■	■	■	■	■	■						
	Establishing/implementing a response work manual	■	■	■	■	■	■	■	■	■	■	■	■
	VISION Conducting government-related (including the MOEL and the KOSHA) affairs												
	Complying with an improvement order issued by the MOEL (safety and health supervision, various inspections, etc.)	■	■	■	■	■	■	■	■	■	■	■	■
	Developing a plan to manage major violations in the event of a MOEL inspection	■	■	■	■	■	■	■	■	■	■	■	■
	Responding to shipbuilding industry prime-subcontractor cooperation level assessment	■	■	■	■	■	■	■	■	■	■	■	■
	Engaging in collaborative activities with related organizations such as shipbuilding industry consultative bodies			■			■			■			■
	Addressing stakeholder complaints and accusations	■	■	■	■	■	■	■	■	■	■	■	■
	Improving regulations that need improvement in safety-related laws, regulations, standards, etc.	■	■	■	■	■	■	■	■	■	■	■	■
	VISION Labor union–related affairs												
	Holding Occupational Safety and Health Committee meetings			■			■			■			■
	Continuing to manage the performance of the agreements made in the Occupational Safety and Health Committee meetings (frequent working-level consultation on current affairs)	■	■	■	■	■	■	■	■	■	■	■	■
	Labor-management joint inspections	■	■	■	■	■	■	■	■	■	■	■	■
	Reviewing improvements on inspections by Occupational Safety and Health Committee members	■	■	■	■	■	■						
	VISION Advancing the management system for hazardous machinery and equipment												
	Conducting periodic and occasional inspections on each machinery and equipment subject to statutory inspection	■	■	■	■	■	■	■	■	■	■	■	■
	Establishing and operate hazardous machinery and equipment management computerized systems	■	■	■	■	■	■	■	■	■	■	■	■
	Completing revision of hazardous machinery and equipment management system standard	■	■	■	■	■	■	■	■	■	■	■	■
Improving and strengthening PSM management system	**VISION** Implementing PSM management system improvements												
	Implementing PSM management system improvements	■	■	■	■	■	■	■	■	■	■	■	■
	Conducting a PSM rating evaluation	■	■	■	■	■	■						
	Preparing and submitting a checklist for the PSM danger alert system	■	■	■	■	■	■	■	■	■	■	■	■

Detailed Action Plan	Implementation Methods	Q1			Q2			Q3			Q4		
		1	2	3	4	5	6	7	8	9	10	11	12
	VISION Fire/explosion risk management												
	Monitoring enterprise-wide explosion hazardous locations	■	■	■	■	■	■	■	■	■	■	■	■
	Improving the explosion-proof performance of cherry pickers in painting shops	■	■	■	■	■	■	■	■	■	■	■	■
Improving safety management concerning firefighting and hazardous substances	**VISION Redefining the fire/hazardous substance work system**												
	Establishing the fire/hazardous substance work system: documents/permits/on-site, etc.	■	■	■	■	■	■	■	■	■	■	■	■
	VISION Improving safety management concerning firefighting and hazardous substances												
	Improving compliance at paint factories, engine commissioning sites, and other hazardous substances workplaces	■	■	■	■	■	■	■	■	■	■	■	■
	Promoting fire safety cooperation projects with fire agencies and group companies			■			■			■			■
	Installing smart smoke detectors in buildings without detectors	■	■	■	■	■	■	■	■	■	■	■	■
	Establishing comprehensive measures for fire safety management for foreigners			■			■			■			■
	Establishing comprehensive countermeasures for lithium battery vehicles / motorcycle fire response	■	■	■	■	■	■	■	■	■	■	■	■
	Implementing statutory/self/occasional inspections and maintenance of fire/hazardous substances	■	■	■	■	■	■	■	■	■	■	■	■
Strengthening disaster prevention/ disaster response capabilities	**VISION Reinforcing integrated control center operation**												
	Redefining the work system in connection with integrated control center advancement	■	■	■	■	■	■	■	■	■	■	■	■
	Revising the Integrated Control Center operation manual	■	■	■	■	■	■	■	■	■	■	■	■
	Minimizing blind spots in safety management monitoring and continuous improvement	■	■	■	■	■	■	■	■	■	■	■	■
	Expanding safety control video storage servers	■	■	■	■	■	■	■	■	■	■	■	■
	Expanding the video-based risk situation analysis system (Hi-CAMs)	■	■	■	■	■	■	■	■	■	■	■	■
	VISION Specializing the emergency response systems												
	Obtaining disaster recovery and business continuity certification (ISO 22301)							■	■	■	■	■	■
	Conducting drills for new types of emergency situations such as electric vehicle fires	■	■	■	■	■	■	■	■	■	■	■	■
	Conducting traffic safety facility inspections	■	■	■	■	■	■	■	■	■	■	■	■

Health Management Section

Detailed Action Plan	Implementation Methods	Q1			Q2			Q3			Q4		
		1	2	3	4	5	6	7	8	9	10	11	12
Expanding health system utilization	**VISION Advancing the health management system**												
	Advancing/operating the Hi-SEs health management system		■	■	■	■	■	■	■	■	■	■	■
	Developing a dedicated platform for one-stop health and medical services		■	■	■	■	■	■	■	■	■	■	■
	Operating a health risk assessment system												
	Developing a health risk assessment system	■	■	■	■	■	■	■	■	■			
	Conducting health risk assessments							■	■	■	■	■	■
	Reinforcing the operation of the health indicator management system												
	Establishing a health indicator management system	■	■	■	■	■	■	■	■	■	■		
	Inspecting indicator management item data and reviewing indicator management standards							■	■	■	■	■	■
Chemical Management	**Strengthening chemical management operability**												
	Operating the chemical management system	■	■	■	■	■	■	■	■	■	■	■	■
	Addressing chemical handling issues on-site (skin condition issues, etc.)	■	■	■	■	■	■	■	■	■	■	■	■
	Conducting regular safety inspections of local exhaust systems										■	■	■
	Hazard Prevention Planning for Ventilation Facilities	■	■	■	■	■	■	■	■	■	■	■	■
Medical Examination	**Improving effectiveness of operation for medical examinations**												
	Appropriate medical examination operation: standard (annually), special (once or twice a year), general (once every other year), pre-deployment medical examinations, etc.	■	■	■				■	■	■			
	Establishing hazardous factor calculation functions for special medical examinations (linked to work environment measurement / chemical management system)				■	■	■	■	■	■	■	■	■
	Improving user convenience for health examination reservation operation (to be incorporated in the development of integrated health management system)	■	■	■	■	■	■	■	■	■	■	■	■
Strengthening health promotion system operation	**Operating a job stress management program**												
	Operating a participatory stress management program				■	■	■	■	■	■	■		
	Operating mental health promotion projects in cooperation with external organizations			■			■			■			■
	Operating an In-house Health Promotion Center												
	Operating and managing the in-house hospital / clinic / oriental medicine clinic	■	■	■	■	■	■	■	■	■	■	■	■
	Inspecting and improving medical facilities and equipment				■	■	■	■	■	■	■	■	■
	Strengthening follow-up management and health promotion activities												
	Expanding operation of health activity programs customized for each group (add yoga, stretching and other programs)			■	■	■	■	■	■	■	■		
	Strengthening follow-up management monitoring (systematic management based on health risk personnel pool data)				■	■	■	■	■	■	■	■	■
	Implementing a subcontractor health promotion program (linked with agencies)												
Strengthening the health management operation system	**Supporting subcontractor health management**												
	Monitoring the operation and improving the usability of subcontractors' healthcare systems			■			■			■			■
	Implementing health management agency meetings and improvements										■	■	

Detailed Action Plan	Implementation Methods	Q1			Q2			Q3			Q4		
		1	2	3	4	5	6	7	8	9	10	11	12
	Monitoring subcontractor follow-up observation / findings / cerebrovascular assessment / work suitability assessment	■	■										
	Monitoring subcontractors with weak health management and implementing technical guidance					■	■					■	■
	Improving the elderly personnel management system												
	Reviewing work suitability assessment / job placement standards and establish management guidelines			■			■			■			■
	Managing person with health-related risks at subcontractors												
	Monitoring medical examinations and re-judgment after placement of persons with health-related risks			■			■			■			■
	Monitoring health management plan preparation	■	■	■	■	■	■	■	■	■	■	■	■
Reinforcing activities to prevent work-related disease and illness	**Managing work-related disease and illness response**												
	Ensuring always-on response to work-related disease and illness (statistical analysis, issue response, etc.)	■	■	■	■	■	■	■	■	■	■	■	■
	Conducting on-site epidemiological investigations for work-related disease and illness (including major diseases at subcontractors)	■	■	■	■	■	■	■	■	■	■	■	■
	Strengthening MSDs Prevention												
	Conducting regular harmful factor surveys for musculoskeletal disorders							■	■	■	■	■	■
	Conducting occasional investigations on the harmful factors of MSDs	■	■	■	■	■	■	■	■	■	■	■	■
	Supporting and monitoring work environment improvement to prevent musculoskeletal disorders							■	■	■	■	■	■
Addressing and controlling infectious diseases	**Addressing and control infectious diseases**												
	Always-on response to in-house infectious diseases (linked with relevant agencies)	■	■	■	■	■	■	■	■	■	■	■	■
Strengthening work environment management	**Operating and advancing working environment measurement management**												
	Regular measurements: Biannual; measurements in a shortened cycle: Once in 3 months	■	■	■	■	■	■	■	■	■	■	■	■
	Monitoring and managing hazardous factors that exceeded the exposure limits in the working environment measurements	■	■	■	■	■	■	■	■	■	■	■	■
	Strengthening on-site inspection activities for work environment measurement (verification of improvement performance implementation, etc.)	■	■	■	■	■	■	■	■	■	■	■	■
	Operating and monitoring hearing/respiratory programs (fit test, etc.) (operation management of hearing conservation program, respiratory protection program)									■	■	■	■
	Improving/strengthening abnormal climate management and response system												
	Strengthening prevention management of health disorders due to abnormally high/low temperatures	■	■	■	■	■	■	■	■	■	■	■	■
	Operating a survey system for heat illness and cold illness	■					■	■	■				■
	Strengthening health and hygiene management												
	Anti-epidemic disinfection: Periodic disinfection (all year round), special disinfection (May to August), additional disinfection (occasional); hygiene inspections of meal service facilities	■	■	■	■	■	■	■	■	■	■	■	■
PPE Management	**Improving PPEs and safety consumables operations**												
	Improving the management of PPEs / subsidiary materials (review/registration of safety shoes, goggles, safety boots, and other materials)	■	■	■	■	■	■	■	■	■	■	■	■
	Monitoring the cost of purchasing PPEs and safety consumables	■	■	■	■	■	■	■	■	■	■	■	■
	Standardizing safety sub-material information in the RMS	■	■	■	■	■	■	■	■	■	■	■	■

Detailed Action Plan	Implementation Methods	Q1			Q2			Q3			Q4		
		1	2	3	4	5	6	7	8	9	10	11	12
	Strengthening PPEs and safety consumables quality control												
	Working on improvements to the PPE/safety consumables	■	■	■	■	■	■	■	■	■	■	■	■
	Monitoring PPEs and safety consumables' performance, quality, safety, etc.	■	■	■	■	■	■	■	■	■	■	■	■
	Carrying out periodic/occasional provision of major safety protective equipment (safety shoes, prescription safety glasses, etc.)	■	■	■	■	■	■	■	■	■	■	■	■

5-2 Business Units' Management Plans for 2025

In 2025, each business unit plans to strengthen support for proactive on-site safety management and strengthening of self-regulated safety capabilities at sub-contractors based on operability-centered self-regulated safety management systems. In addition, we will take the lead in building safer workplaces through reinforcement of risk assessments.

SAFETY
HEALTH

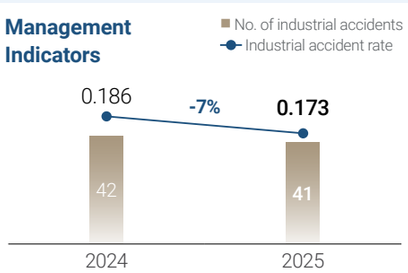
Business Unit Management Objectives for 2025

Shipbuilding Business Unit

Key Promotion Tasks

- Strengthen on-site implementation of the safety systems
- Selectively focus on vulnerable risk types
- Establish a culture of active caring

Management Indicators

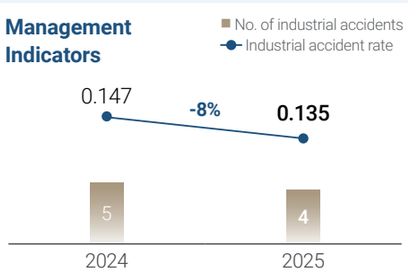


Offshore & Energy Business Unit

Key Promotion Tasks

- Strengthen the operability of our commitments
- Improve the workplace safety culture through participation of all members
- Build customer satisfaction and lead the development of safety management systems

Management Indicators

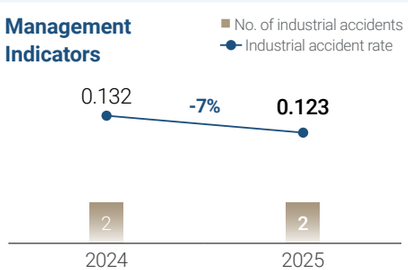


Naval & Special Ship Business Unit

Key Promotion Tasks

- Strengthen implementation of Our Commitments
- Improve a safety culture that cares for all employees' safety
- Strengthen response capabilities to adapt to changes

Management Indicators

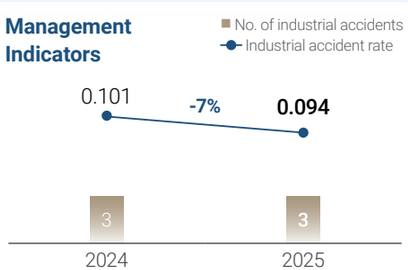


Engine & Machinery Business Unit

Key Promotion Tasks

- Systematize on-site safety management centered on feedback
- Strengthen on-site implementation through detail management
- Establish a system to build subcontractors' self-regulated safety capabilities
- Strengthen the safety of eco-friendly fuel facilities

Management Indicators



Detailed Implementation Plan for Achieving 2025 Safety, Health, and Environment Management Goals

Shipbuilding Business Unit

Detailed Action Plan	Implementation Methods	Q1			Q2			Q3			Q4		
		1	2	3	4	5	6	7	8	9	10	11	12
Improving on-site risk assessment level based on work order system	VISION Improving on-site risk assessment levels												
	Providing customized checklists by work content (based on Hi-Standard standards)	■	■	■	■	■	■						
	Developing worker feedback functions for work standards	■	■	■	■	■	■						
	Incorporating the AI writing assessment technology	■	■	■	■	■	■						
Advancing in-house safety systems based on safety activities	VISION Reviewing and revising the Safety Golden Rules												
	Revising the rules to advance to a higher safety culture level	■	■	■									
	VISION Strengthening the operability and reliability of triple safety checks												
	Listening to on-site voices and reviewing system improvements		■			■							
	Improving on Hi-SEs triple check functions: work commencement & cancellation functions, etc.	■	■	■	■	■	■						
	VISION Revising the safety forecast system												
	Redefining on-site-oriented issuance criteria and action items through active leader participation	■	■	■									
	VISION Strengthening the on-site operability of the special crane safety rules												
	Consolidating the special crane safety rules through the participation of all production/safety members	■	■	■	■	■	■	■	■	■	■	■	■
	Inspecting the plan for special crane safety rules			■			■			■			■
Improving and strengthening emergency evacuation drill implementation standards	VISION Enhancing ship emergency response capabilities												
	Establishing systematic standards/procedures for emergency evacuation drills				■	■	■						
	VISION Building an emergency bell interlocking system within ships												
	Creating a rapid evacuation environment through improved emergency facilities	■	■	■	■	■	■	■	■	■	■	■	■
	Building an emergency bell interlocking system using metal surface wave communication	■	■	■	■	■	■	■	■	■	■	■	■
Focused safety management of confined spaces	VISION Revising the confined space standards (paradigm shift)												
	Establishing clear confined space standards adapted to shipbuilding industry characteristics	■	■	■	■	■	■	■	■	■	■	■	■
	VISION Expanding the complex gas monitoring system												
	Establishing system management entities, specifying measurement target criteria, and creating warning alarm response manuals	■	■	■									
Improving safety management plans for vulnerable time periods & concurrent work	VISION Enhancing safety management capacity during vulnerable hours												
	Improving phased safety management capabilities based on risk analysis for vulnerable hours	■	■	■	■	■	■	■	■	■	■	■	■
	Strengthening unannounced on-site inspections and monitoring during hours without safety supervisors	■	■	■	■	■	■	■	■	■	■	■	■
	VISION Redefining concurrent work processes												
	Strengthening PTW concurrent (painting/fire) work filtering function for PTW	■	■	■	■	■	■						
	Adding automatic notification and schedule adjustment functions for concurrent works	■	■	■	■	■	■						

Detailed Action Plan	Implementation Methods	Q1			Q2			Q3			Q4		
		1	2	3	4	5	6	7	8	9	10	11	12
Creating a culture of active mutual caring	VISION Engaging in various safety activities for colleague care												
	Launching active caring programs and improving the relevant operations (safety education for all personnel led by responsible executives)	■	■	■	■	■	■	■	■	■	■	■	■
	Designating and implementing a safety care day	■	■	■	■	■	■	■	■	■	■	■	■
	Granting incentives for outstanding active caring activities	■	■	■	■	■	■	■	■	■	■	■	■
	VISION Strengthening safety communication activities between safety and production departments												
	Holding shipbuilding, offshore, and special ship safety section/ team leader workshops (for consistent safety standard application)			■			■			■			■
	Engaging in reminder activities for safety production consultation issues	■	■	■	■	■	■	■	■	■	■	■	■
	Holding meetings with Safe Clover and subcontractor safety managers			■			■			■			■
	VISION Strengthening safety management for foreign workers												
	Assessing safety capabilities through safety capability level diagnosis surveys and Korean language proficiency assessment	■	■	■	■	■	■	■	■	■	■	■	■
Strengthening internal and external safety communications	VISION Publishing integrated Safety Frontier												
	Sharing safety insights related to shipbuilding, offshore, and special ships	■	■	■	■	■	■	■	■	■	■	■	■
	VISION Establishing and operating an integrated HSE section												
	Securing expertise in dealing with shipowners by training specialized staff	■	■	■	■	■	■	■	■	■	■	■	■
	Helping professional staff build their work capabilities	■	■	■	■	■	■	■	■	■	■	■	■

Offshore & Energy Business Unit

Detailed Action Plan	Implementation Methods	Q1			Q2			Q3			Q4		
		1	2	3	4	5	6	7	8	9	10	11	12
Improving execution through reinforcement of safety systems	Reinforcing PTW triple safety checks												
	Revising target departments and checklists (reflecting volume changes, on-site voices)	■	■	■									
	Improving the quality of triple safety check details and results (inspection details, photos, etc.)				■	■	■				■	■	■
	Strengthening on-site operability of special crane safety rules												
	Conducting joint crane inspections for each production and safety level and providing feedback			■	■	■				■	■	■	
	Improving the technology and personnel section of the crane task force (smart collision prevention system, hook LED application, deployment of skilled personnel, etc.)	■	■	■	■	■	■	■	■	■	■	■	■
Strengthening safety management for vulnerable time periods/ types	Improving potential risks by monitoring during vulnerable hours												
	Conducting on-site inspections focused on high risk work during safety gap times and providing feedback	■	■	■				■	■	■			
	Establishing and stabilizing a vendor safety management system												
	Establishing a vendor safety management system and monitoring its operability		■	■	■	■	■				■	■	■

Detailed Action Plan	Implementation Methods	Q1			Q2			Q3			Q4		
		1	2	3	4	5	6	7	8	9	10	11	12
On-site safety through volatility management	Establishing pre-safety work plans to prepare against fluctuations in production volumes												
	Conducting and managing risk assessments for works related to new ship types (LNG, COT, VLEC) and volume changes (D/H, special ships, etc.) (Hi-Standard)	■	■	■	■	■	■	■	■	■	■	■	■
	Creating safety work manuals for new ship types and using them in training	■	■				■	■	■	■			
Fostering a culture of mutual safety caring	Launching active caring programs												
	Establishing active caring programs (utilizing Hi-SEs risk reporting)	■	■	■	■	■	■	■	■	■	■	■	■
Strengthening safety communication activities at each level	Holding meetings with production department heads and subcontractor representatives												
	Sharing safety information and collaborating on improvements through meetings		■		■		■		■		■		■
	Listening to the voices of supervisors and workers												
	Discovering/improving gray zone factors through themed VOC processes centered on high risk works (improve risk factors reflecting on-site opinions on confined areas, pressure, argon works, etc.)	■	■	■	■	■	■	■	■	■	■	■	■
Strengthening safety management for foreign workers	Conducting safety capability level diagnosis and special training for foreign workers												
	Establishing foreign safety assessment standards and providing feedback based on the results (provide incentives for outstanding evaluators and customized special training to poor performers)				■	■	■				■	■	■
Revising offshore HSE procedures	Revising offshore procedures to reflect the latest practices and systems												
	Keeping the procedures up to date by incorporating new systems and safety policies and providing induction brochures to clients		■	■	■	■	■	■	■				
Advancing safety system internalization and client communication programs	Improving safety levels by standardizing advanced safety systems												
	Carrying out standardization for continuity of key advanced standards during offshore construction (safety net installation, guard rail height increase, surface wave communication amplifier installation, etc.)		■	■	■	■	■						
	Publishing integrated Safety Frontier and training HSE professionals												
	Adding an offshore section in Safety Frontier (sharing major improvements and issues) and supporting HSE professional training (obtaining international safety qualifications, etc.)	■	■	■	■	■	■	■	■	■	■	■	■

Naval & Special Ship Business Unit

Detailed Action Plan	Implementation Methods	Q1			Q2			Q3			Q4		
		1	2	3	4	5	6	7	8	9	10	11	12
Strengthening "Our Commitments" Implementation	**VISION** Strengthening execution through advanced safety management												
	Strengthening the operability of the high risk work triple safety checks	■	■	■	■	■	■						
	Strengthening the operability of the special crane safety rules	■	■	■	■	■	■	■	■	■	■	■	■
	VISION Consolidating work orders/on-site risk assessment												
	Monitoring work orders and on-site risk assessment (TBM)			■			■			■			■
	Reinforcing non-routine/ad-hoc risk assessment management systems	■	■	■	■	■	■						
	VISION Building the capabilities of safety management support personnel												
	Adopting special training and qualification systems for cherry pickers, fire, confined space monitors	■	■	■	■	■	■	■	■	■	■	■	■
Improving safety culture to keep all employees safe	**VISION** Engaging in active caring safety activities												
	Operating a mutual care system	■	■	■	■	■	■	■	■	■	■	■	■
	VISION Strengthening safety communication at each level												
	Holding periodic meetings with production organizations			■			■			■			■
	VISION Supporting improvement of foreign workers' safety awareness and capabilities												
	Conducting category-specific level diagnosis for foreign workers	■	■	■	■	■	■						
	Listening to foreign workers' voices through meetings						■						■
Strengthening response capabilities to volatility	**VISION** Identifying high risk works related to warranty repairs and MRO in advance												
	Identifying new high risk works and reviewing works subject to triple check targets	■	■	■	■	■	■						
	VISION Reinforcing safety inspections to address increase in short-term works (defense manufacturer)												
	Improving management systems for short-term high risk works	■	■	■	■	■	■	■	■	■	■	■	■
	VISION Building a safety education curriculum related to the Peruvian safety technology transfer												
	Developing curricula and conducting outreach training							■	■	■	■	■	■
	VISION Establishing a Naval & Special Ship HSE Management System												
	Creating a Naval & Special Ship Business Unit HSE Manual for overseas businesses	■	■	■	■	■	■	■	■	■	■	■	■

Engine & Machinery Business Unit

Detailed Action Plan	Implementation Methods	Q1			Q2			Q3			Q4		
		1	2	3	4	5	6	7	8	9	10	11	12
Systematizing on-site safety management centered on feedback	**VISION** Strengthening on-site safety inspection feedback management												
	S Establishing classification standards for on-site safety inspection results and managing/notifying results	■	■	■	■	■	■	■	■	■	■	■	■
	VISION Providing feedback on VOC results for the four priority risk management tasks												
	S Establishing and promoting major agenda improvement plans based on VOC results	■	■	■	■	■	■	■	■	■	■	■	■
Strengthening on-site execution through detail management	**VISION** Reviewing the effectiveness of major standards/measures												
	S Reviewing the effectiveness of standards/measures related to triple checks and major accidents	■	■	■	■	■	■						
	VISION Establishing detailed management standards for the four priority risk management tasks												
	S Strengthening inspection activities according to detailed management standards for the four priority risk management tasks	■	■	■	■	■	■	■	■	■	■	■	■
	VISION Strengthening activities for wider compliance with the special crane safety rules												
	C Creating and distributing videos to promote compliance with the special crane safety rules		■	■	■	■	■	■					
Establishing a system to build subcontractors' self-regulated safety management capabilities	**VISION** Conducting safety/health technology exchange with major external subcontractors												
	C Selecting external subcontractors to participate in the exchange (based on impact on the production process) and conduct safety/health technology exchange				■				■				
	VISION Building a customized safety/health technical guidance process for in-house subcontractors												
	C Providing customized technical guidance according to safety level and capability assessment results of each subcontractor			■					■				
	VISION Advancing the individual capability diagnosis and improvement systems for foreign workers												
	C Conducting individual capability diagnosis for foreign workers		■	■	■	■	■	■	■	■	■	■	■
	C Implementing customized training based on diagnosis results (ISTC)		■	■	■	■	■	■	■	■	■	■	■
Strengthening the safety of eco-friendly fuel facilities	**VISION** Enhancing eco-friendly fuel facility management levels and safety awareness												
	S Reviewing risks in areas near gas supply facilities (flammable material storages, smoking areas, etc.) and strengthening safety management for hot work				■	■	■						
	VISION Conducting advanced risk assessments of new eco-friendly facilities and strengthening safety devices												
	S Conducting risk assessments in advance, reviewing safety devices, and expanding the integrated control room	■	■	■	■	■	■	■	■	■	■	■	■
	VISION Strengthening emergency response capabilities for hazardous substance leaks												
	T Conducting basic emergency response training and scenario-based drills		■			■			■			■	
	T Expanding the emergency notification system for hazardous substance leaks	■	■	■	■	■							

2025 SAFETY AND HEALTH MANAGEMENT REPORT

Published on February 6, 2025
Published by Corporate Safety and Health Office, HD HHI
Tel. +82-52-202-5062
Fax. +82-52-202-3152
hsenews@hd.com
Address 1000, Bangeojinsunhwando-ro, Dong-gu, Ulsan