



HSE Occupational Hazard Factor Detection Report

Document No.: CLADDING-HSE-PD-54

I. Report Summary (New Module, Extracting Core Information)

This report conducts systematic detection and evaluation of occupational hazard factors in the company's core business areas (warehousing, loading/unloading, maintenance, installation) in accordance with the *Law of the People's Republic of China on the Prevention and Control of Occupational Diseases*, *Administrative Regulations on Occupational Health in the Workplace*, and the GBZ 2 series standards. (Covering normal production conditions: temperature 25-32°C, humidity 45-75%) A total of 26 detection points were set up, involving 6 categories of hazard factors including noise, dust, chemical toxicants, high temperature, power frequency electric field, and lighting, covering 25 warehouse managers, 18 equipment operators, 12 maintenance technicians, 8 electricians, and 15 management personnel.

Core Conclusions:

1. The overall compliance rate is 92.3% (146 out of 158 valid data meet the standards), with a 100% compliance rate for chemical factors (dust, toxicants) and 88.9% for physical factors (noise);
2. Only the noise in the grinding area of the maintenance workshop (86.5dB (A)), welding fumes (6.2mg/m³) and manganese compounds (0.18mg/m³) in the equipment maintenance welding area exceed the standards;
3. Comprehensive compliance shall be achieved through engineering control (sound insulation, dust removal), personal protective equipment (noise-canceling earplugs, dust masks), and management optimization (training, health monitoring) to ensure the occupational health of employees.

II. Basic Report Information (Integrating New Format Elements, Standardizing Traceability)

Item	Content to Be Filled (Integrating Old and New Formats, Associating with Business Scenarios)
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Report No.	CPPMEC-HSE-PD-54
Detection Client	Pipeline Materials and Equipment Co., Ltd. (Address: _____ Contact Person: _____ Contact Information: _____)
Detection Implementer	[Name of Detection Institution] (Qualification Certificate No.: [Number], holding CMA certification, with occupational hazard factor detection within the certification scope)
Detection Cycle and Time	Monitoring Cycle: (Annual Monitoring) On-site Detection: June 10 - June 20, 2024 (8:00-18:00 daily, including peak operation hours)
Detection Environment	Temperature 25-32°C, humidity 45-75%, no extreme weather, normal operation of equipment (load rate of forklifts, cranes, machine tools, etc.: 80-90%)
Detection Purpose	1. Identify the distribution of hazard factors in each business area and determine compliance with the limits specified in GBZ 2.1-2019 and GBZ 2.2-2007; 2. Assess occupational health risks of posts and propose targeted protective measures; 3. Improve the occupational health management system to meet regulatory requirements
Detection Basis	1. Laws and Regulations: <i>Law of the People's Republic of China on the Prevention and Control of Occupational Diseases</i> (Revised in 2021), <i>Administrative Regulations on Occupational Health in the Workplace</i> (Order No. 5 of the National Health Commission); 2. Technical Standards: - GBZ/T 159-2004 <i>Specification for Monitoring and Sampling of Harmful Substances in the Air of Workplace</i> ; - GBZ 2.1-2019 <i>Occupational Exposure Limits for Harmful Factors in the Workplace - Part 1: Chemical Harmful Factors</i> ; - GBZ 2.2-2007 <i>Occupational Exposure Limits for Harmful Factors in the Workplace - Part 2: Physical Factors</i> ; - GBZ/T 189.8-2007 (Noise), GBZ/T 192.1-2007 (Dust), GBZ/T 189.7-2007 (High Temperature); 3. Enterprise Documents: <i>Occupational Health Management System of Pipeline Materials and Equipment Co., Ltd., 2024 Annual Occupational Health Work Plan</i>

III. Detection Scope and Objects (Supplementing Posts and Areas in New Format, Covering All Businesses)

(I) Detection Scope (Integrating Old and New Areas, Refining Business Modules)

Business Module	Detection Area	Newly Added Supplementary Areas	Main Operation Content
Material Warehousing Module	1. Hazardous Chemical Storage Area (Acetylene / Hydraulic Oil / Rust Remover) 2. General Material Warehousing Area (Pipe Fittings / Equipment)	3. Packaging Operation Area (Material Encapsulation)	1. Loading, unloading, storage, and inspection of hazardous chemicals; 2. Handling and stacking of general materials; 3. Material packaging and labeling
Loading, Unloading and Transportation Module	1. Forklift Operation Area 2. Crane Lifting Area 3. Material Loading and Unloading Platform	-	1. Forklift operation (material picking and transportation); 2. Crane operation (heavy equipment lifting); 3. Manual loading and unloading assistance
Equipment Maintenance Module	1. Mechanical Maintenance Workshop (Machine Tool / Equipment Disassembly) 2. Electrical Maintenance Area (Circuit Inspection) 3. Chemical Storage Area (Cleaning Agent / Lubricating Oil)	4. Spraying Operation Point (Equipment Surface Spraying)	1. Equipment disassembly, grinding, welding, and assembly; 2. Electrical circuit inspection and tool debugging; 3. Spraying operation and chemical use

Equipment Installation Module	1. Open-Air Installation Site (Scaffolding Operation) 2. Indoor Assembly Area (Equipment Assembly) 3. Welding Operation Area	-	1. Scaffolding erection and high-altitude installation; 2. Assembly of equipment components and bolt tightening; 3. Steel structure welding and cutting
Auxiliary Module	-	1. Power Distribution Room (Power Supply Management) 2. Office Area (Administrative Office)	1. Operation and maintenance of power distribution equipment and circuit inspection; 2. Daily office work and meetings

(II) Detection Objects (Supplementing Posts in New Format, Clarifying Headcount and Hazards)

Post / Occupation	Number of Detected Personnel	Main Hazard Factors	Number of Detection Points	Involved Business Areas
Warehouse Manager	25	Noise (forklifts / handling equipment), dust (material handling)	8	General Material Warehousing Area, Packaging Operation Area
Equipment Operator	18	Noise (machine tools / cranes), high temperature (open-air in summer)	6	Loading, Unloading and Transportation Module, Open-Air Installation Site
Maintenance Technician	12	Dust (grinding / welding), chemical toxicants	4	Mechanical Maintenance Workshop,

		(cleaning agents / spraying)		Spraying Operation Point
Electrician	8	Power frequency electric field (power distribution equipment), noise (power distribution cabinets)	3	Power Distribution Room, Electrical Maintenance Area
Management Personnel	15	Noise (equipment around the office area), lighting (office environment)	5	Office Area, Duty Rooms in Various Business Areas
Installer (Newly Added)	10	High temperature (open-air in summer), vibration (handheld tools)	4	Open-Air Installation Site, Indoor Assembly Area

(III) Detection Frequency and Methods (Maintaining Original Standards, Supplementing New Items)

1. Detection Frequency:

- Chemical factors (dust, toxicants): Sampled twice at each detection point (24-hour interval), with 8-hour time-weighted average concentration calculated;
- Physical factors (noise, high temperature, power frequency electric field, lighting): Continuous monitoring for 3 operation cycles (30 minutes / cycle) at each detection point, with average values calculated;

1. Detection Methods for Newly Added Items:

- Power frequency electric field: GBZ/T 189.3-2007 *Measurement of Physical Factors in the Workplace - Part 3: Power Frequency Electric Field*, using a power frequency electric field meter (Model: EFA-300, No.: JC2024009);
- Lighting: GBZ/T 189.4-2007 *Measurement of Physical Factors in the Workplace - Part 4: Lighting*, using an illuminance meter (Model: TES-1332A, No.: JC2024010).

IV. Detection Items and Methods (Supplementing Items in New Format, Improving Technical System)

Category of Hazard Factors	Detection Item	Detection Method (Based on Standards)	Detection Instrument (Model + No.)	Detection Limit / Measuring Range
Chemical Harmful Factors	<p>1. Total Dust (Maintenance Grinding / Welding / Warehousing)</p> <p>2. Respirable Dust (Maintenance Grinding)</p> <p>3. Acetylene (Hazardous Chemical Storage Area)</p> <p>4. Hydrochloric Acid (Rust Remover)</p> <p>5. Benzene Series (Benzene / Toluene, Spraying / Cleaning Agent)</p> <p>6. Solvent Gasoline (Maintenance)</p> <p>7. Acetone (Spraying Operation Point)</p>	<p>1. GBZ/T 192.1-2007 (Filter Membrane Weighing Method)</p> <p>2. GBZ/T 192.2-2007 (Cyclone Separation Method)</p> <p>3. GBZ/T 300.36-2017 (Gas Chromatography)</p> <p>4. GBZ/T 300.20-2017 (Ion Chromatography)</p> <p>5. GBZ/T 300.66-2017 (Gas Chromatography)</p> <p>6. GBZ/T 300.64-2017 (Gas Chromatography-Mass Spectrometry)</p> <p>7. GBZ/T 300.62-2017 (Gas Chromatography)</p>	<p>1. Dust Sampler (CCZ-1000, JC2024001)</p> <p>2. Respirable Dust Sampler (FC-1A, JC2024002)</p> <p>3. Gas Chromatograph (GC-2014, JC2024003)</p> <p>4. Gas Chromatography-Mass Spectrometer (GC-MS QP2020, JC2024005)</p>	<p>1. Total Dust: 0.1mg/m³</p> <p>2. Benzene: 0.001mg/m³</p> <p>3. Acetone: 0.01mg/m³</p> <p>4. Solvent Gasoline: 0.1mg/m³</p>
Physical Factors	<p>1. Noise (All Areas)</p> <p>2. High Temperature (Open-Air / Workshop in Summer)</p> <p>3.</p>	<p>1. GBZ/T 189.8-2007 (Sound Level Meter Method)</p> <p>2. GBZ/T 189.7-2007 (WBGT Method)</p>	<p>1. Sound Level Meter (AWA5688, JC2024006)</p> <p>2. High Temperature Measuring Instrument</p>	<p>1. Noise: 30-130dB (A)</p> <p>2. Power Frequency Electric Field: 0.01-100kV/m</p>

Vibration (Handheld Tools / Forklifts) 4. Power Frequency Electric Field (Power Distribution Room) 5. Lighting (Office / Operation Area)	3. GBZ/T 189.6-2007 (Vibration Meter Method) 4. GBZ/T 189.3-2007 (Power Frequency Electric Field Meter Method) 5. GBZ/T 189.4-2007 (Illuminance Meter Method)	(WBGT-2006, JC2024007) 3. Power Frequency Electric Field Meter (EFA-300, JC2024009) 4. Illuminance Meter (TES-1332A, JC2024010)	3. Lighting: 0-20000lx
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V. Detection Results and Analysis (Integrating Old and New Data, Quantitative Benchmarking)

(I) Detection Results of Physical Factors (Supplementing Points and Items in New Format)

Detection Area	Detection Item	Location of Detection Point	Detection Value	National Standard Limit	Judgment Result (<input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified)	Main Sound Source / Cause
Warehousing Module - General Warehousing Area	Noise (Equivalent A-Weighted Sound Level)	East Side of Warehousing Area (Forklift Operation)	78.5dB(A)	85dB(A) (8h)	<input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified	Noise from internal combustion forklift (CPD30) operation, operation frequency: 15-20 times per day
Loading and Unloading	Noise (Equivalent A-Weighted Sound Level)	Crane Operation Position	82.3dB(A)	85dB(A) (8h)	<input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified	Noise from bridge

Module - Equipment Operation Area	Weighted Sound Level)					crane (LD5t) operation, slightly higher noise during braking
Maintenance Module - Mechanical Maintenance Workshop	Noise (Equivalent A-Weighted Sound Level)	Grinding Workstation	86.5dB(A)	85dB(A) (8h)	<input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified	Noise from angle grinder (100mm) grinding carbon steel parts, no sound insulation measures, daily operation duration: 3-4 hours
Maintenance Module - Welding Area	Noise (Equivalent A-Weighted Sound Level)	Welding Workstation	84.8dB(A)	85dB(A) (8h)	<input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified	Noise from manual arc welding (current 180-200A), close to the limit
Auxiliary Module - Power Distribution Room	Power Frequency Electric Field	1m in Front of Power Distribution Cabinet	0.3kV/m	5kV/m (8h)	<input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified	Electric field radiation from 10kV power distribution equipment, intensity

						increases with decreasing distance
Auxiliary Module - Office Area	Lighting (Illuminance)	Office Desktop	350lx	300lx (Office)	<input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified	LED lighting fixtures, brightness meets office needs
Installation Module - Open-Air Operation Area	High Temperature (WBGT Index)	Installation Workstation (14:00 in Summer)	30.5°C	32°C (Outdoor)	<input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified	Ambient temperature 35°C in summer, natural ventilation, staff rotation (10-minute break per hour)
Maintenance Module - Spraying Operation Point	Noise (Equivalent A-Weighted Sound Level)	Spraying Workstation	76.2dB(A)	85dB(A) (8h)	<input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified	Noise from spraying equipment operation, noise reduction assisted by ventilation fans

(II) Detection Results of Chemical Factors (Supplementing Toxicant Items in New Format)

Detection Area	Detection Item	Location of	Detection Value	National Standard	Judgment Result	Operation Condition
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		Detection Point (Breathing Zone)	(8h Weighted)	Limit	(<input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified)	Remarks
Warehousing Module - General Warehousing Area	Total Dust	Pipe Fitting Handling Workstation	1.2mg/m ³	8mg/m ³ (Other Dust)	<input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified	Manual handling of metal pipe fittings, no obvious dust emission, daily handling volume: approximately 50 pieces
Warehousing Module - Packaging Operation Area	Total Dust	Packaging Workstation	2.8mg/m ³	8mg/m ³ (Other Dust)	<input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified	Carton packaging operation, paper dust, good ventilation
Maintenance Module - Mechanical Maintenance Workshop	Total Dust (Grinding)	Grinding Workstation	4.5mg/m ³	8mg/m ³ (Talc Dust)	<input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified	Grinding of carbon steel parts, dust removal equipment not activated, dust diffusion range: approximately 2m
Maintenance Module - Welding Area	Total Dust (Welding Fumes)	Welding Workstation	6.2mg/m ³	4mg/m ³ (Welding Fumes)	<input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified	Manual arc welding, no local exhaust, smoke accumulation

						n, daily welding duration: 4-5 hours
Maintenance Module - Welding Area	Manganese and Its Compounds	Welding Workstation	0.18mg/m ³	0.1mg/m ³	<input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified	Manganese compounds associated with welding fumes, operators not wearing dust masks in a standardized manner
Maintenance Module - Spraying Operation Point	Acetone	Spraying Workstation	62.3mg/m ³	450mg/m ³ (PC-STEEL)	<input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified	Spraying of solvent-based coatings, local exhaust facilities in operation, acetone content in coatings: approximately 10%
Maintenance Module - Chemical Storage Area	Solvent Gasoline	Near Cleaning Agent Storage Cabinet	85.6mg/m ³	300mg/m ³ (PC-STEEL)	<input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified	Solvent gasoline used for equipment cleaning, sealed storage, daily usage: 1-2 times
Warehousing Module - Hazardous	Benzene	Paint Storage Area	Not Detected	10mg/m ³ (PC-STEEL)	<input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified	Benzene content in paint ≤0.1%,

Chemical Storage Area						ventilation fans operated for 8 hours daily
Warehousing Module - Hazardous Chemical Storage Area	Toluene	Paint Storage Area	2.5mg/m ³	100mg/m ³ (PC-STEL)	<input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified	Toluene used as solvent in paint, concentration far below the limit

VI. Evaluation of Occupational Hazard Factors (Supplementing Temporal-Spatial Distribution and Compliance Rate in New Format)

(I) Overall Compliance Rate Statistics (Core Indicator in New Format)

Category of Hazard Factors	Number of Detection Points	Number of Qualified Points	Compliance Rate (%)	Number of Exceeding Points	Exceeding Rate (%)	Main Exceeding Areas
Physical Factors	18	16	88.9	2	11.1	Grinding area (noise) in maintenance workshop, welding area (manganese compounds)
Chemical Factors	8	8	100	0	0	-
Total	26	24	92.3	2	7.7	-

(II) Temporal-Spatial Distribution Characteristics (New Module in New Format)

1. Temporal Distribution Characteristics (Analysis by Time Period)

Time Period	Average Noise Level (dB (A))	Average Dust Concentration (mg/m ³)	High Temperature WBGT (°C)	Feature Analysis
Morning (8:00-12:00)	81.2	3.1	28.5	High number of equipment start-ups at the beginning of operations, slightly higher noise; dust concentration gradually increases with workload; low temperature
Noon (12:00-14:00)	75.8	2.2	31.8	Reduced workload (lunch break), decreased noise and dust; temperature reaches the daily maximum, heatstroke prevention required
Afternoon (14:00-18:00)	82.5	3.8	30.2	Workload resumes to peak, noise and dust rebound; temperature decreases slowly, high-temperature

				protection still required
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2. Spatial Distribution Characteristics (Risk Classification by Area)

Area Type	Main Hazard Factors	Risk Level (<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High)	Pollution Degree Description	Key Protective Measures
Maintenance Workshop	Noise, welding fumes, manganese compounds	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High	Multiple factors overlapping, noise and manganese compounds exceeding standards, highest health risk	Install sound insulation and dust removal facilities; mandatory use of noise-canceling earplugs and dust masks
Open-Air Installation Site	High temperature, vibration	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High	High temperature in summer close to the limit, vibration affecting joints, medium risk	Adjust operation time; wear cooling vests and anti-vibration gloves
Warehousing Area	Noise, dust	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High	Noise and dust meet standards, but long-term exposure still poses cumulative risks, low risk	Optimize forklift operation routes; regular cleaning to reduce dust
Power Distribution Room	Power frequency electric field	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High	Electric field intensity far below the limit, no health risk,	Maintain a safe distance ($\geq 1\text{m}$); regular detection of

			extremely low risk	electric field intensity
Office Area	Noise, lighting	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High	Noise and lighting meet standards, no health risk, extremely low risk	Use low-noise office equipment; regular maintenance of lighting fixtures

(III) Analysis of Key Issues (Integration of Old and New Content, In-Depth Traceability)

1. Excessive Noise in the Grinding Area of the Maintenance Workshop (86.5dB (A))
 - Cause of Exceeding Standard: The rated noise of the angle grinder (100mm) is 90dB (A), with no sound insulation or vibration reduction measures; the workshop has a small space (15m long × 8m wide), leading to enhanced noise reflection; the distance between operators and equipment is only 1-2m, resulting in high exposure intensity.
 - Health Impact: Long-term exposure (3-4 hours per day) can cause hearing loss and tinnitus, with a 20% risk of noise-induced deafness for employees with more than 10 years of service.
1. Excessive Welding Fumes (6.2mg/m³) and Manganese Compounds (0.18mg/m³) in the Welding Area of the Maintenance Workshop
 - Cause of Exceeding Standard: No local exhaust facilities, leading to smoke being inhaled by operators after vertical diffusion; non-standard wearing of dust masks (some employees only hang masks on their ears); high frequency of welding operations (4-5 hours per day), resulting in large cumulative exposure.
 - Health Impact: Welding fumes can cause "welder's pneumoconiosis", and manganese compounds can damage the central nervous system, manifested as limb tremors and memory loss.

VII. Rectification Suggestions (Integrating Old and New Measures, Clarifying Time Limits and Responsibilities)

(I) Engineering and Technical Measures (Source Control, Supplementing Sound Insulation and Dust Removal in New Format)

Rectification Area	Targeted Hazard Factors	Specific Measures	Responsible Department	Completion Time Limit	Expected Effect (Compliance Target)
Grinding Area of Maintenance Workshop	Noise	<p>1. Install "sound insulation enclosures" (height 2.2m, sound insulation capacity $\geq 20\text{dB (A)}$) to enclose the grinding workstation;</p> <p>2. Replace high-noise equipment (angle grinders, grinding machines) with low-noise models (e.g., Bosch GWS 18V-125, noise $\leq 82\text{dB (A)}$);</p> <p>3. Lay vibration-damping pads (thickness 5cm) on the ground to reduce vibration transmission</p>	Equipment Management Department	September 30, 2024	Noise $\leq 85\text{dB (A)}$, meeting the limit of GBZ 2.2-2007
Welding Area of	Welding Fumes +	<p>1. Install "side-suction local exhaust hoods" (air</p>	Equipment Management	August 31, 2024	Welding fumes $\leq 4\text{mg/m}^3$, manganese

Maintenance Workshop	Manganese Compounds	<p>volume $\geq 2000\text{m}^3/\text{h}$, with air inlets $\leq 50\text{cm}$ from welding points; 2. Equip "mobile welding fume purifiers" (purification efficiency $\geq 95\%$) to move with welding workstations; 3. Set up 3m-high enclosures between the welding area and other areas to reduce cross-contamination</p>	t Department		compounds $\leq 0.1\text{mg}/\text{m}^3$
Spraying Operation Point of Maintenance Workshop	Volatilization of Organic Toxicants	<p>1. Install "water curtain spray booths" (air volume $\geq 3000\text{m}^3/\text{h}$) to collect spraying waste gas; 2. Treat waste gas with activated carbon adsorption devices before discharging at high</p>	Equipment Management Department	October 31, 2024	Concentrations of acetone and toluene reduced by more than 50%, maintaining compliance

		altitude (exhaust stack height ≥6m)			
Open-Air Installation Site	High Temperature	1. Set up "temporary sunshades" (area ≥20 m ² per workstation) and equip industrial fans (air volume ≥5000m ³ /h); 2. Adjust operation time in summer (June- August): 6:30-11:00 in the morning, 15:00-18:30 in the afternoon, avoiding high- temperature periods	Installation Engineering Department	June 30, 2024 (Before Summer)	WBGT index ≤32°C, heatstroke risk reduced by 80%
Power Distribution Room	Power Frequency Electric Field	1. Set up "safety warning lines" (1m distance) in front of power distribution cabinets, prohibiting long-term stay; 2. Install	Equipment Management Department	July 31, 2024	Power frequency electric field intensity ≤0.5kV/m, no health risk

		shielding plates (stainless steel material) in high-voltage areas to reduce electric field radiation			
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(II) Personal Protective Measures (Terminal Protection, Supplementing Distribution Management in New Format)

Post	Targeted Hazard Factors	Requirements for Protective Equipment Configuration	Distribution and Management Measures	Responsible Department	Completion Time Limit
Maintenance Technician (Grinding / Welding)	Noise + Dust + Manganese Compounds	1. Noise-canceling earplugs (SNR≥25dB, e.g., 3M 1110), 1 pair per day; 2. KN95 dust masks (GB 2890-2009), 1 mask every 2 days; 3. Impact-resistant goggles (GB 14866-2006) during welding	1. Uniform distribution by the Warehousing Department on the 25th of each month, with employees signing for confirmation; 2. Team leaders check wearing compliance daily before work; employees not wearing properly are not allowed to	Warehousing Management Department + Maintenance Workshop	Immediate Implementation

			work; 3. Organize training on correct wearing of protective equipment quarterly (including video demonstrations)		
Installer (Open-Air in Summer)	High Temperature	1. Cooling vests (with replaceable ice packs, e.g., Draeger Cool vest), ice packs replaced once a day; 2. Salt-containing drinking water (4-6g salt per liter), 2L per person per day	1. Distributed by the Administrative Department twice a day (morning and afternoon) in summer (June-August); 2. Set up drinking water points on-site to ensure water quality; 3. Record employees' water intake and rest conditions	Administrative Logistics Department + Installation Engineering Department	June 30, 2024
Electrician	Power Frequency Electric Field + Noise	1. Insulating gloves (10kV resistance, GB/T 17622-2022), 1 pair per month; 2. Noise-canceling earplugs	1. Store protective equipment in a dedicated cabinet in the power distribution room with labels; 2. Check the voltage	Equipment Management Department + Power Distribution Room	Immediate Implementation

		(SNR≥20dB), 1 pair per week	resistance performance of insulating gloves monthly, replace immediately if expired		
Spraying Operator	Organic Toxicants + Noise	1. Gas masks (equipped with organic vapor cartridges, e.g., 3M 6200+6001), cartridges replaced once a week; 2. Noise-canceling earplugs (SNR≥22dB)	1. Check the airtightness of gas masks before use; 2. Replace cartridges immediately if expired or with abnormal odors, and record replacement time	Maintenance Workshop + Warehousing Department	Immediate Implementation

(III) Management Measures (Long-Term Supervision, Supplementing Emergency Drills in New Format)

1. Occupational Health Training and Drills:

- Organize occupational disease protection training once a quarter, covering content such as health impacts of hazard factors (e.g., symptoms of noise-induced deafness and pneumoconiosis), operation of protective facilities (method for turning on exhaust hoods), and emergency response (e.g., escape from toxicant leakage). Conduct a closed-book exam after training (passing score: 80 points) and archive scores;
- Conduct "occupational disease emergency drills" (e.g., evacuation from excessive welding fumes, first aid for heatstroke) once every six months. Summarize and improve after drills, and archive video records;
- Responsible Departments: Human Resources Department + Quality, Safety and Environmental Protection Department; Completion Time Limit: End of each quarter / end of each half-year.

1. Health Monitoring and File Management:

- Conduct occupational health examinations once a year for employees in exceeding-standard posts (maintenance technicians, installers), including items such as lung function (for dust), pure tone audiometry (for noise), blood manganese (for manganese compounds), and electrocardiogram (for high temperature). Establish electronic health files;
- Conduct pre-employment occupational health examinations for new employees and post-departure examinations for retiring employees. Immediately transfer employees with occupational contraindications (e.g., hearing impairment, asthma) from their original posts;
- Responsible Department: Administrative Logistics Department (entrusting Grade-A tertiary hospitals); Completion Time Limit: Before December each year.

1. Regular Re-Evaluation and Monitoring:

- Conduct re-detection of exceeding-standard areas (grinding area, welding area of maintenance workshop) after 3 months (October 10-20, 2024) to verify rectification effects;
- Conduct comprehensive annual detection of normal areas, and supplement detection in a timely manner for newly added hazard factors (e.g., vibration from new equipment);
- Establish an "occupational hazard factor monitoring ledger" and archive each detection report, rectification record, and re-evaluation result for traceability;
- Responsible Department: Quality, Safety and Environmental Protection Department; Completion Time Limit: Re-detection in September 2024, annual detection in June each year.

VIII. Conclusions (Integrating Core Conclusions of Old and New Formats)

1. In the 2024 annual occupational hazard factor detection of Pipeline Materials and Equipment Co., Ltd., 26 points and 6 categories of hazard factors were covered, with an overall compliance rate of 92.3%. Chemical factors (dust, toxicants) all met the standards, while among physical factors, only the noise in the grinding area of the maintenance workshop (86.5dB (A)), welding fumes (6.2mg/m³) and manganese compounds (0.18mg/m³) in the welding area exceeded the standards, with an exceeding rate of 7.7%.
2. The main causes of exceeding standards are: insufficient engineering protection facilities (no sound insulation, dust removal, or exhaust systems), non-standard use of personal protective equipment (wearing rate of masks and earplugs is only 60%), and non-optimized operation time (continuous operation during high-temperature periods).
3. By implementing the measures proposed in this report, including "engineering control (to be completed by the end of October 2024) + personal protection (immediate implementation) + management optimization (normalization)", all hazard factors can meet the standards, reducing employees' occupational health risks by more than 90%, which

complies with the requirements of the *Law on the Prevention and Control of Occupational Diseases* and the GBZ 2 series standards.

IX. Approval Opinions (New Module in New Format, Clarifying Powers and Responsibilities)

Approval Entity	Opinion Content	Signature / Seal	Date
Detection Institution	"The detection data in this report is true and valid, in line with national technical standards, and the conclusions are objective and fair. It can be used as the basis for occupational health management of Pipeline Materials and Equipment Co., Ltd."	(Seal)	June 25, 2024
Person in Charge of Detection Institution		Signature: _____	June 25, 2024
Client (Pipeline Materials and Equipment Co., Ltd.)	"We agree with the conclusions of this report and will formulate an implementation plan in accordance with the rectification suggestions to ensure the completion of all engineering measures by the end of October 2024 and the normalized implementation of protection and management requirements."	(Seal)	June 28, 2024

Person in Charge of Client		Signature: _____	June 28, 2024
Competent Authority (Occupational Health Section of Local Health Commission)	"We agree to the filing of this report. The enterprise is required to submit rectification progress regularly and conduct comprehensive annual detection to ensure the health rights and interests of employees."	(Seal)	July 5, 2024
Person in Charge of Competent Authority		Signature: _____	July 5, 2024

X. Report Attachments and Instructions (Integrating Old and New Attachments, Supplementing Preservation Requirements)

(I) Report Attachments

1. Attachment 1: Copy of the qualification certificate of the detection institution (including CMA certification scope);
2. Attachment 2: Calibration certificates of detection instruments (No.: JC2024001-JC2024010);
3. Attachment 3: Original on-site detection records (including photos of sampling points, instrument readings, and employee signatures);
4. Attachment 4: Distribution map of detection points in the company's business areas (marking exceeding-standard points);
5. Attachment 5: Excerpts of GBZ 2.1-2019 and GBZ 2.2-2007 standards (relevant limit clauses).

(II) Report Instructions (New Module in New Format)

1. This report is only responsible for the working conditions and samples detected during June 10 - June 20, 2024. The detection results are not applicable to abnormal working conditions such as shutdown or overload;

2. It is recommended that the enterprise conduct comprehensive occupational hazard factor detection at least once a year, and supplement detection when new equipment is added or processes are changed;
3. This report shall serve as the core basis for occupational health management, employee training, and health monitoring, with a retention period of long-term preservation (until 5 years after equipment scrapping);
4. Without the written consent of the detection institution, this report shall not be partially copied, altered, or used for commercial purposes.