



HSE Equipment and Facilities Safety and Environmental Protection Management Procedure (Updated Version)

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1 Purpose

To standardize the Health, Safety and Environment (HSE) management throughout the full lifecycle of the Company's equipment and facilities (including procured equipment, warehousing facilities, transportation supporting facilities, etc.), identify safety risks and environmental impacts in links such as equipment/facility design and selection, procurement, installation, use, maintenance, modification, and scrapping; establish a closed-loop mechanism of "prevention in advance, control in process, and improvement afterwards"; prevent safety accidents (e.g., mechanical injuries, equipment overturning) and environmental pollution incidents (e.g., oil leakage, excessive exhaust emissions) caused by equipment/facility failures; safeguard employees' life safety, the integrity of Company assets, and ecological environment safety; and comply with the requirements of *PIPING SYSTEM PTE LTD Equipment and Facilities HSE Management Specifications*, *COMPANY Equipment Safety and Environmental Protection Control Requirements*, as well as laws and regulations such as the *Special Equipment Safety Law* and *Environmental Protection Law*. This procedure is hereby formulated.

2 Scope of Application

This procedure applies to all departments of the Company (Equipment Management Department, Warehousing Center, Transportation Management Department, Procurement Department, HSE Management Department, etc.) and all employees, covering the following types of equipment/facilities and full-lifecycle links:

2.1 Equipment Types

- Special Equipment: Hoisting machinery (bridge cranes, forklifts), on-site special motor vehicles (transport forklifts, tractors), pressure vessels (compressed air storage tanks, dangerous goods storage tanks), pressure pipelines (oil and gas transmission pipelines), boilers (if any);

- Warehousing Equipment: Shelving systems, handling equipment (conveyors, stackers), warehousing environment control equipment (temperature and humidity controllers, ventilation equipment);
- Transportation Supporting Equipment: Material transportation vehicles (including affiliated cooperative vehicles), loading and unloading platforms, vehicle maintenance equipment;
- Electrical Equipment: Power transformation and distribution systems, explosion-proof electrical equipment, emergency power generation equipment, lightning protection devices;
- General Equipment: Office special equipment (elevators), maintenance tools (electric drills, cutting machines), fire-fighting equipment (fire pumps, automatic fire-extinguishing systems);
- Environmental Protection Equipment: Oil-water separators, exhaust gas purifiers, noise control equipment, solid waste treatment equipment.

2.2 Facility Types

- Warehousing Facilities: Material warehouses (including dedicated dangerous goods warehouses), loading and unloading platforms, storage tank areas (including oil and chemical storage tanks);
- Supporting Facilities: Fire-fighting facilities (fire hydrants, fire extinguishers, fire sand pools), wastewater collection ditches, exhaust gas discharge pipelines, emergency rescue facilities (eye wash stations, emergency showers), lightning protection and grounding facilities;
- Workplace Environment Facilities: Equipment guardrails, warning signs, lighting facilities, ventilation and exhaust facilities.

2.3 Full-Lifecycle Links

Including design and selection, procurement access, installation and commissioning, operation and use, maintenance, hazard investigation, fault handling, modification management, inspection and testing, environmental protection control, scrapping and disposal, and emergency management of equipment and facilities.

3 Terms and Definitions

3.1 HSE Status of Equipment and Facilities

The state where equipment and facilities meet safe operation requirements (no failures, intact protection) and comply with environmental emission standards (no leakage, no excessive emissions).

3.2 Special Equipment

Equipment involving life safety and high risk, which requires mandatory inspection and testing in accordance with the *Special Equipment Safety Law* (e.g., hoisting machinery, pressure vessels, pressure pipelines).

3.3 Environmental Protection Facilities

Devices used to control pollutant emissions (e.g., oil-water, exhaust gas, noise) from equipment and facilities and treat solid waste (e.g., oil separators, mufflers, solid waste crushers).

3.4 Full-Lifecycle Management of Equipment and Facilities

The whole-process HSE control of equipment and facilities from design and selection, procurement and acceptance, installation and commissioning, use and maintenance, modification and optimization to scrapping and disposal, ensuring controllable risks in all links.

3.5 Major Equipment Safety Hazards

Hazards that may cause major safety accidents (e.g., equipment overturning, fire, explosion) and require immediate shutdown for rectification (see Appendix A for determination criteria).

3.6 Modification of Equipment and Facilities

Adjustments to the structure, process parameters, control systems, safety and environmental protection facilities of equipment and facilities, which may affect the HSE status.

4 Responsibility Assignment

4.1 Equipment Management Department (Lead Department for Equipment and Facilities)

- Formulate and revise this procedure in a coordinated manner, and organize HSE operation and maintenance training for equipment and facilities;
- Be responsible for HSE technical review (safety performance, environmental indicators, intrinsic safety) of equipment and facilities design and selection;
- Establish HSE management ledgers for equipment and facilities (including special equipment archives, environmental protection equipment operation ledgers), and track inspection, testing and maintenance plans;
- Organize HSE control for maintenance, hazard investigation, fault handling and modification management of equipment and facilities;
- Supervise the daily operation and maintenance of environmental protection facilities (e.g., oil-water separators, exhaust gas purifiers), and implement energy conservation management;
- Take the lead in HSE assessment and compliant disposal for scrapping of equipment and facilities, and manage equipment-related waste.

4.2 HSE Management Department (Centralized Supervision Department, also known as Quality, Safety and Environmental Protection Department)

- Supervise the implementation of this procedure, and participate in HSE review of design and selection, acceptance, modification and scrapping of equipment and facilities;
- Organize the identification and hierarchical disposal of major safety hazards of equipment and facilities, and track the closed-loop of rectification;
- Monitor the compliance of environmental emissions from equipment and facilities (e.g., sampling and testing of noise, wastewater, exhaust gas), and supervise the disposal of hazardous waste;
- Participate in the investigation and analysis of safety accidents and environmental pollution incidents involving equipment and facilities, and formulate preventive measures;
- Conduct regular special inspections on HSE management of equipment and facilities, evaluate management effectiveness, and organize emergency drills.

4.3 Warehousing Center

- Be responsible for daily HSE management of warehousing equipment (shelves, stackers) and warehousing facilities (warehouses, storage tank areas);
- Conduct daily inspections of equipment and facilities (e.g., shelf load-bearing, storage tank tightness, fire-fighting facility effectiveness), and report identified hazards;
- Implement environmental protection requirements in warehousing areas (e.g., collection of dangerous goods leakage, classified storage of solid waste), and cooperate with environmental testing;
- Cooperate with the Equipment Management Department in maintenance, inspection and testing, and modification implementation of warehousing equipment.

4.4 Transportation Management Department

- Be responsible for daily HSE management of transportation supporting equipment and facilities (transportation vehicles, loading and unloading platforms);
- Supervise the environmental compliance of transportation vehicles (exhaust emissions, oil leakage), and implement regular vehicle testing and energy conservation control;
- Conduct daily inspections of transportation equipment (braking systems, tire wear, emergency equipment) to ensure safe operation;
- Cooperate with the Equipment Management Department in maintenance, modification management and scrapping disposal of transportation equipment.

4.5 Procurement Department

- Conduct procurement in accordance with HSE technical requirements for equipment and facilities, and give priority to suppliers with energy-saving, environmental-friendly and safe performance;
- Collect safety technical documents of equipment and facilities (operation manuals, MSDS, energy-saving certifications), and submit them to the Equipment Management Department;
- Participate in HSE compliance review of procurement acceptance of equipment and facilities, and ensure suppliers have corresponding HSE qualifications and performance.

4.6 Maintenance Team (Equipment Maintenance Execution Department)

- Conduct maintenance of equipment and facilities in accordance with maintenance plans, and implement HSE measures during maintenance (work permits, protective equipment);
- Record the maintenance process (fault causes, replaced parts, environmental treatment), and participate in root cause analysis of faults;
- Verify the HSE status of equipment and facilities after maintenance (safety device functions, leakage testing, energy consumption indicators) before delivery for use;
- Cooperate with the Equipment Management Department in equipment modification implementation and inspection and testing.

4.7 Management

- Company Top Management / Management Representative: Approve major HSE management policies for equipment and facilities, HSE assessment reports for major procurement and scrapping, and ensure HSE management resource input;
- Equipment-In-Charge Leader: Approve major modification plans for equipment and facilities and rectification plans for major hazards;
- Department Heads: Approve daily maintenance plans and operation procedures for equipment and facilities in their departments, and review hazard rectification plans;
- Equipment Operators: Implement equipment and facilities operation procedures, conduct pre-shift inspections, and report abnormalities and faults.

4.8 All Employees

- Operate equipment and facilities in strict accordance with procedures, and refuse illegal instructions;
- Immediately stop using and report HSE hazards of equipment and facilities (abnormal noise, leakage, abnormal energy consumption) when identified;
- Participate in HSE training, emergency drills and hazard investigation of equipment and facilities, and implement energy conservation and emission reduction requirements.

5 Management Procedures

5.1 Pre-Management of Equipment and Facilities (Design & Selection - Procurement - Installation)

5.1.1 HSE Management for Design and Selection

1. Selection Requirements:

- The Equipment Management Department, together with the HSE Management Department and Engineering Technology Department, formulates HSE technical standards for selection, giving priority to intrinsically safe, low-energy-consumption and low-pollution equipment (e.g., electric forklifts replacing fuel forklifts);
- Conduct HSE risk assessment, evaluate the full-lifecycle HSE costs (procurement, maintenance, environmental treatment) of equipment, and avoid selecting obsolete equipment explicitly prohibited by the state;
- Special equipment shall comply with national mandatory safety standards (e.g., hoisting machinery with dual protection of limit and braking, pressure pipelines complying with GB 50316 *Code for Design of Industrial Metal Pipes*).

2. Selection Process:

- The demand department puts forward equipment requirements, and clarifies HSE function requirements (e.g., explosion-proof grade, noise limit, energy consumption indicator);
- The Equipment Management Department organizes HSE review, and invites external experts to participate in the demonstration of high-risk equipment selection if necessary;
- The approved selection plan is included in the procurement plan; unapproved plans shall be re-optimized.

5.1.2 HSE Management for Procurement and Acceptance

1. Procurement Control:

- Clarify HSE technical requirements (safety performance, environmental indicators, energy-saving standards, after-sales service) in procurement contracts, and stipulate HSE liability for breach of contract;
- The Procurement Department verifies supplier qualifications (HSE management system certification, energy-saving certification, special equipment manufacturing license) and HSE performance in the past 3 years (no major accidents);
- For equipment with a single unit value \geq RMB 500,000, conduct on-site investigations before procurement to verify the HSE management level of suppliers' production processes.

2. Acceptance Process:

- After arrival, the Equipment Management Department takes the lead in acceptance, with the participation of the HSE Management Department and the user department:
 - Document Verification: Verify product certificates of conformity, test reports, energy-saving certifications, and MSDS (for chemical-related equipment);

- Appearance Acceptance: Check for no deformation of equipment, complete protective devices, and clear labels (safety warnings, energy consumption labels);
- Performance Acceptance: Conduct no-load testing of safety devices (emergency stop, limit) and verify whether energy consumption and noise meet standards;
- Issue the *HSE Acceptance Report for Equipment Procurement* (Appendix B) for qualified equipment, and establish initial HSE archives; unqualified equipment shall be coordinated by the Procurement Department for return or replacement and shall not be put into use.

5.1.3 HSE Management for Installation and Commissioning

1. Pre-Installation Preparation:

- The Equipment Management Department formulates the *HSE Plan for Equipment and Facilities Installation*, clarifying the installation process, safety protection measures (high-altitude operation protection, hot work permits), and environmental control measures (wastewater collection, solid waste classification);
- The installation unit shall have corresponding qualifications (special equipment installation permit), and installation personnel shall pass special HSE training and assessment;
- Inspect the installation site environment (site flatness, fire-fighting facilities, emergency passages) to eliminate pre-existing hazards.

2. Installation Process Control:

- Strictly implement the HSE plan; high-risk operations (hot work, hoisting) shall apply for the *Work Permit* (Appendix C), with full supervision by the Maintenance Team;
- Installation of environmental protection facilities (e.g., exhaust gas pipelines) shall ensure tightness and no leakage to avoid secondary pollution;
- Classify and collect solid waste (packaging materials, waste parts) generated during installation; hazardous waste shall be disposed of by qualified units.

3. Commissioning and Acceptance:

- Conduct safety inspection confirmation (power cut-off, isolation, adequate protection) before commissioning, and conduct phased commissioning in accordance with operation procedures;
- After commissioning, the Equipment Management Department organizes HSE acceptance (load testing, safety interlock verification, environmental emission testing) and issues the *HSE Acceptance Report for Installation and Commissioning* (Appendix D);
- Qualified equipment shall be delivered to the user department, and the HSE archives of equipment shall be updated simultaneously; unqualified equipment shall be rectified before re-acceptance.

5.2 HSE Management for Equipment and Facilities Use

5.2.1 Operation Procedure Management

1. The Equipment Management Department formulates the *Equipment Operation Procedure* for each piece of equipment, including:
 - Operation steps, safety precautions (e.g., prohibition of overloading, requirements for wearing protective devices);
 - Emergency disposal measures (fault shutdown, leakage treatment), energy consumption control parameters (e.g., optimal operation load of equipment);
 - Regular review of operation procedures (once a year), and update based on equipment modifications and fault experience.
2. Operators shall receive special training (equipment principles, procedures, emergency disposal) and obtain the *Equipment Operation Qualification Certificate* (Appendix E) before taking up posts;
 - Operators of special equipment shall hold the national *Special Operation Operation Certificate* and operate only within the validity period of the certificate;
 - Personnel returning to work after an absence of 3 months or more shall pass re-training and assessment.

5.2.2 Daily Use Control

1. Pre-Shift Inspection: Operators implement the process of "pre-shift inspection - in-shift monitoring - post-shift cleaning":
 - Pre-Shift: Use the *Daily Inspection Form for Equipment and Facilities* (Appendix F) to check the HSE status of equipment (oil level, instruments, safety devices, energy consumption indicators), and report immediately if abnormalities are found;
 - In-Shift: Operate in accordance with procedures, without overloading or illegal operations; monitor operating parameters (temperature, pressure, noise) in real time, and record the *HSE Ledger for Equipment Operation* (Appendix G);
 - Post-Shift: Clean oil stains and debris on the equipment surface, turn off power/gas sources, complete shift handover records, and implement energy-saving measures (e.g., turning off power for idle equipment).
2. Operation Monitoring:
 - Implement "personnel-specific, equipment-specific, post-specific" management for important equipment (power transformation and distribution systems, pressure vessels); the Equipment Management Department conducts special inspections monthly;
 - Install safety alarms and interlock protection for high-risk equipment (hoisting machinery, storage tanks), which shall automatically shut down in case of abnormalities;
 - The HSE Management Department conducts sampling testing of equipment energy consumption and environmental emissions quarterly (e.g., wastewater COD, equipment noise) to ensure compliance.

5.3 HSE Management for Equipment and Facilities Maintenance

5.3.1 Preventive Maintenance

1. The Equipment Management Department formulates the *Annual Preventive Maintenance Plan* (Appendix H) based on equipment types, clarifying:
 - Daily Maintenance: Daily/weekly inspections (cleaning, fastening, lubrication) implemented by operators;
 - Regular Maintenance: Monthly/quarterly overhauls (part replacement, precision calibration, energy consumption calibration) implemented by the Maintenance Team;
 - Annual Overhaul: Comprehensive overhaul conducted annually, with participation of suppliers or third-party professional institutions (qualified for special equipment).
2. Use qualified spare parts (complying with safety and environmental standards) during maintenance, and record the *HSE Record for Equipment Maintenance* (Appendix I), including maintenance content and environmental treatment (waste oil recycling, waste part classification);
3. Conduct HSE verification after maintenance: test the function of safety devices, check for no leakage, and confirm normal energy consumption indicators.

5.3.2 HSE Management for Overhaul Operations

1. Pre-Overhaul Preparation:
 - The Maintenance Team conducts overhaul risk analysis (identifying mechanical injury, electric shock, leakage risks) and formulates control measures;
 - Apply for the *HSE Permit for Equipment Overhaul Operation* (Appendix J), clarifying the operation scope, protection measures, and emergency plan;
 - Cut off the equipment power/gas sources, post warning signs, set up operation isolation zones, and prepare emergency materials (oil absorbent pads, fire extinguishers).
2. Overhaul Process Control:
 - Strictly operate within the permitted scope; wear safety belts for high-altitude operations; clean flammable materials and assign fire monitors for hot work;
 - The HSE Management Department conducts irregular spot checks; immediately stop illegal operations (e.g., overhaul without power cut-off, operation without protection) and issue rectification notices.
3. Post-Overhaul Acceptance:
 - The Maintenance Team cleans the operation site, restores the equipment protective devices, and tests the equipment operation status;
 - The Equipment Management Department, together with the user department, conducts acceptance; isolation can be lifted and equipment can be put into use only after qualification.

5.3.3 Fault Management

1. Fault Reporting: Operators shall immediately shut down the equipment upon discovering a fault, report to the Equipment Management Department within 15 minutes, and fill out the *Equipment Fault Report* (Appendix K), specifying the fault phenomenon and impact scope;
2. Fault Analysis:
 - General Faults: The Maintenance Team shall identify the cause within 24 hours and formulate a repair plan;
 - Major Faults (e.g., pressure vessel leakage, hoisting machinery jamming): The Equipment Management Department takes the lead in conducting root cause analysis (5Why method) to clarify human, equipment, and management factors;
3. Corrective and Preventive Actions: Formulate corrective actions (maintenance, part replacement) and preventive actions (optimize maintenance plans, strengthen training), track implementation, and share fault experience and lessons (e.g., case notifications).

5.4 Management of Equipment and Facilities Modification

5.4.1 Modification Types

- Structural Modification: Replacement of main components of equipment (e.g., boom of hoisting machinery, head of pressure vessel);
- Process Parameter Modification: Adjustment of equipment operation load, temperature, pressure (e.g., modification of transportation vehicle load limit);
- Control System Modification: Modification of equipment electrical control logic and safety interlock programs;
- Safety and Environmental Protection Facility Modification: Adjustment of guardrail height, optimization of exhaust gas treatment processes.

5.4.2 Modification Process

1. Modification Application: The demand department submits the *HSE Application for Equipment and Facilities Modification* (Appendix L), explaining the modification reason, content, expected effect, and attaching the modification plan (including drawings, parameters);
2. Risk Assessment:
 - The Equipment Management Department, together with the HSE Management Department, conducts HSE risk assessment for modification to identify safety and environmental risks possibly caused by modification (e.g., equipment overload due to load increase);
 - External experts shall be invited to participate in the assessment for major modifications (involving special equipment structure, environmental emissions);

3. Approval and Implementation:

- General Modifications (impact limited to a single department): Approved by the head of the Equipment Management Department;
- Major Modifications (cross-departmental impact, high risk): Approved by the equipment-in-charge leader;
- Conduct training for relevant personnel before modification implementation (modification content, operation requirements); the Maintenance Team implements in accordance with the plan and implements risk control measures;

4. Modification Acceptance: Within 1 week after implementation, the Equipment Management Department, together with the HSE Management Department, conducts acceptance, verifies the HSE status, and updates equipment archives (operation procedures, maintenance plans).

5.5 Environmental Protection and Energy Conservation Management for Equipment and Facilities

5.5.1 Environmental Protection Facility Management

1. The Equipment Management Department establishes the *Operation Ledger for Environmental Protection Facilities* (Appendix M), recording equipment name, treatment capacity, and operation parameters (e.g., oil-water treatment volume, exhaust gas treatment efficiency);
2. Environmental protection facilities shall operate simultaneously with main equipment; unauthorized shutdown is prohibited; the Maintenance Team inspects the status of environmental protection facilities weekly (e.g., filter blockage, chemical residue);
3. The HSE Management Department tests the emission effect of environmental protection facilities quarterly (wastewater compliance rate, exhaust gas emission concentration) to ensure compliance with GB 8978 *Integrated Wastewater Discharge Standard* and GB 16297 *Integrated Emission Standard of Air Pollutants*;
4. Formulate emergency plans for environmental protection facilities (e.g., excessive emissions caused by treatment system failures) and conduct emergency drills at least once a year.

5.5.2 Energy Conservation Management

1. The Equipment Management Department monitors the energy consumption of main equipment (e.g., fuel consumption per 100km for transportation vehicles, power consumption of air compressors), establishes energy consumption ledgers, and identifies high-energy-consuming equipment;
2. Promote energy-saving technologies and equipment (e.g., LED lighting replacing traditional lamps, frequency conversion motors replacing ordinary motors), and optimize equipment operation parameters (e.g., adjusting air compressor loading pressure);

3. Conduct energy audits annually, evaluate the rationality of equipment energy consumption, formulate energy-saving targets (e.g., 3% annual energy consumption reduction), and track completion status;
4. All employees participate in energy conservation and consumption reduction (e.g., turning off idle equipment, reasonably arranging equipment operation time); reward departments/individuals with significant energy-saving results.

5.5.3 Waste Management

1. Classify and collect equipment-related waste:
 - General Waste (waste packaging, waste parts): Recycled and utilized by compliant units;
 - Hazardous Waste (waste oil, waste filters, waste batteries): Stored in dedicated containers with labels, disposed of by qualified units, and record the *Hazardous Waste Disposal Ledger* (Appendix N);
2. The Maintenance Team reduces waste generation during maintenance (e.g., extending filter service life, recycling waste oil for reuse);
3. The HSE Management Department supervises the compliance of waste disposal and verifies the qualifications and waybills of disposal units.

5.6 Hazard Investigation and Rectification for Equipment and Facilities

5.6.1 Investigation Mechanism

1. Daily Investigation: Operators conduct pre-shift inspections; the user department conducts random checks weekly, focusing on safety devices, leakage, and abnormal energy consumption;
2. Special Investigation: The HSE Management Department conducts quarterly special HSE investigations of equipment and facilities, covering:
 - Effectiveness of safety accessories (safety valves, pressure gauges) for special equipment;
 - Operation status of environmental protection facilities (no leakage, up-to-standard emissions);
 - Integrity of protective facilities (guardrails, warning signs);
 - Reliability of insulation and grounding for electrical equipment;
3. Seasonal Investigation: Investigate rainproof and waterlogging prevention facilities (e.g., drainage in storage tank areas) in rainy seasons; investigate anti-freezing and anti-slip measures (e.g., replacement of equipment lubricating oil) in winter.

5.6.2 Hazard Classification and Disposal

- Major Hazards (Appendix A): Immediately shut down the equipment; the Equipment Management Department formulates a rectification plan within 24 hours; the HSE

Management Department supervises rectification; resume operation only after qualified acceptance;

- General Hazards: The user department formulates a rectification plan and completes rectification within 3 days; the Equipment Management Department verifies;
- Minor Hazards: Operators rectify on-site immediately and record in the pre-shift inspection form.

5.6.3 Rectification Closure

Establish the *HSE Hazard Rectification Ledger for Equipment and Facilities* (Appendix O), recording hazard descriptions, rectification measures, responsible persons, and completion time limits; submit an acceptance application after rectification; hold liable those who fail to rectify on time.

5.7 HSE Management for Inspection and Testing of Equipment and Facilities

5.7.1 Inspection and Testing Requirements

1. Special Equipment: Conduct regular testing by qualified institutions in accordance with the *Special Equipment Safety Law*:
 - Hoisting Machinery: Once a year;
 - Pressure Vessels: Once every 3 years (once a year for toxic medium containers);
 - Pressure Pipelines: Once every 6 years;
 - Safety Valves: Calibrated once every 6 months; pressure gauges calibrated once every quarter;
2. Electrical Equipment: Power transformation and distribution systems tested once every 2 years; explosion-proof electrical equipment tested once a year;
3. Environmental Protection Equipment: Exhaust gas/wastewater treatment facilities tested once a quarter; noise tested once every 6 months;
4. General Equipment: Conduct comprehensive performance testing once a year, focusing on verifying safety performance and energy consumption indicators.

5.7.2 Inspection Process

1. The Equipment Management Department formulates an inspection and testing plan 1 month in advance and notifies the user department;
2. Prepare before testing (equipment shutdown, site cleaning, provision of historical records);
3. Cooperate with the testing institution during testing, record testing data, and rectify unqualified items immediately;

4. Update equipment archives for qualified testing, and affix qualification labels; immediately shut down unqualified equipment and re-test after rectification.

5.8 HSE Management for Equipment and Facilities Scrapping

5.8.1 Scrapping Conditions

Initiate the scrapping process when equipment and facilities meet one of the following conditions:

- Reach the design service life, and safety performance and energy consumption indicators cannot meet requirements;
- Major faults cannot be repaired, or repair costs exceed 60% of the replacement value;
- Environmental emissions fail to meet standards and have no modification value;
- Equipment explicitly eliminated or prohibited by the state.

5.8.2 Scrapping Process

1. The user department submits the *HSE Application for Equipment and Facilities Scrapping* (Appendix P), attaching the scrapping reason, test report, and energy consumption assessment;
2. The Equipment Management Department takes the lead in conducting HSE assessment, clarifying:
 - Safety disposal requirements (special equipment disassembly shall have qualifications; electrical equipment shall be disassembled after power cut-off);
 - Environmental disposal requirements (waste oil recycling, hazardous part classification, metal recycling);
3. Approval: General equipment approved by the head of the Equipment Management Department; major equipment (single unit value \geq RMB 500,000) approved by the equipment-in-charge leader;
4. Scrapping Disposal: Entrust qualified units to implement, sign disposal agreements, clarify HSE responsibilities, and prohibit unauthorized disassembly and discarding;
5. After disposal, collect disposal certificates (disassembly records, waste disposal waybills), update equipment ledgers, and cancel the use registration certificate of special equipment.

5.9 Emergency Management for Equipment and Facilities

5.9.1 Emergency Plan Formulation

The Equipment Management Department, together with the HSE Management Department, formulates special emergency plans for equipment and facilities, including:

- Equipment Fault Emergencies (hoisting machinery overturning, pressure vessel leakage, electrical fire);
- Environmental Pollution Emergencies (oil leakage, excessive exhaust gas emission);
- Clarify the emergency organization structure, response process (alarm, disposal, rescue), and resource allocation (leakage collection tools, emergency vehicles, protective equipment).

5.9.2 Emergency Drills and Training

1. Conduct emergency drills for equipment and facilities at least once a year (e.g., storage tank leakage disposal, forklift fault rescue), record drill effects, and optimize plans;
2. Conduct emergency training for equipment operators (initial leakage treatment, fire extinguisher use, alarm process) to ensure mastery of basic disposal skills;
3. Inspect emergency materials regularly (once a quarter) to ensure integrity and effectiveness, with clear storage locations.

5.9.3 Emergency Disposal

When a safety accident or environmental pollution incident occurs to equipment and facilities:

1. On-site personnel immediately stop equipment operation, take initial control measures (valve closure, use of oil absorbent pads, fire extinguishing), and evacuate unrelated personnel;
2. Report to the HSE Management Department and Equipment Management Department within 15 minutes; concealment or delay is prohibited;
3. Activate the emergency plan, organize emergency rescue, and contact external rescue forces (fire-fighting, environmental protection departments) if necessary;
4. After incident disposal, the Equipment Management Department, together with the HSE Management Department, conducts an investigation, analyzes the cause, formulates preventive measures, and updates the management procedure.

5.10 Record and Archive Management

5.10.1 Record Content

The Equipment Management Department establishes HSE archives for equipment and facilities, including:

- Pre-Management: Selection review records, procurement acceptance reports, installation and commissioning acceptance reports;
- Use Management: Operation procedures, operation qualification certificates, operation ledgers, daily inspection forms;

- Maintenance Management: Maintenance plans, maintenance records, fault reports, inspection and testing reports;
- Modification and Scrapping: Modification applications and acceptance records, scrapping applications and disposal certificates;
- Environmental Protection Management: Operation ledgers for environmental protection facilities, energy consumption records, waste disposal ledgers.

5.10.2 Retention Requirements

- Paper Records: Archived by the Equipment Management Department, with a retention period of 3 years after equipment scrapping;
- Electronic Records: Synchronously uploaded to the Company's HSE management system to ensure traceability;
- Archive Access: Requires approval from the head of the Equipment Management Department; unauthorized copying and alteration are strictly prohibited.

6 Supporting Documents

- *Equipment and Facilities HSE Management Specifications*
- *COMPANY Equipment Safety and Environmental Protection Control Requirements*
- *Special Equipment Safety Law*
- *Environmental Protection Law*
- *GB 12348 Emission Standard of Environmental Noise at Boundaries of Industrial Enterprises*
- *GB 8978 Integrated Wastewater Discharge Standard*
- *Company HSE Change Management Procedure*
- *Company HSE Work Permit Management Procedure*
- *Company HSE Emergency Management Procedure*
- *Company Special Equipment Safety Management System*
- *Company Hazardous Waste Management Measures*

7 Appendices

Appendix A: Criteria for Determining Major Safety Hazards of Equipment and Facilities

| Hazard Category | Determination Criteria | Examples |
|-----------------|------------------------|----------|
|-----------------|------------------------|----------|

| | | |
|--|--|---|
| <p>Special Equipment Hazards</p> | <p>1. Failure of safety accessories (safety valves, limit devices); 2. Cracking or deformation of main structure; 3. Use beyond the inspection period; 4. Excessive corrosion thickness of pressure pipelines</p> | <p>Failure of limit switches for hoisting machinery, cracking of pressure vessel walls, insufficient thickness of pressure pipelines due to corrosion</p> |
| <p>Electrical Equipment Hazards</p> | <p>1. Insulation breakdown of power transformation and distribution systems; 2. Seal failure of explosion-proof electrical equipment; 3. Failure of emergency power generation equipment to start; 4. Excessive grounding resistance (>10Ω)</p> | <p>Damage to explosion-proof motor junction boxes, grounding resistance of 15Ω</p> |
| <p>Environmental Protection Facility Hazards</p> | <p>1. Shutdown of treatment facilities leading to excessive emissions; 2. Pipeline leakage causing environmental pollution; 3. Random disposal of hazardous waste; 4. Noise exceeding standards by more than 20dB</p> | <p>Shutdown of oil-water separators, rupture of exhaust gas pipelines, dumping of waste oil into rainwater ditches</p> |
| <p>General Equipment Hazards</p> | <p>1. Missing protective devices (protective covers, guardrails); 2. Failure of braking systems; 3. Untreated abnormal noise/vibration; 4. Energy consumption exceeding standards by more than 30%</p> | <p>Forklift brake failure, missing protective covers for cutting machines, 40% excessive energy consumption of air compressors</p> |

Appendix B: HSE Acceptance Report for Equipment Procurement (Template)

| | | | |
|---------------------------|---|--|--|
| Equipment Name | | Model Specification | |
| Supplier Name | | Procurement Contract No. | |
| Acceptance Date | Year Month Day | Acceptance Personnel | Equipment Management Department: HSE Management Department: User Department: |
| I. Document Verification | Acceptance Item | Acceptance Result (<input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified) | Remarks |
| | Product Certificate of Conformity | | |
| | Test Report (Safety/Environmental/Energy-Saving) | | |
| | MSDS (for Chemical-Related Equipment) | | |
| | Special Equipment Manufacturing License | | |
| II. Appearance Acceptance | 1. No deformation or damage to equipment | <input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified | |
| | 2. Complete safety protective devices | <input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified | |

| | | | |
|-----------------------------|---|--|--|
| | 3. Clear and complete warning signs | <input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified | |
| | 4. Standard energy consumption labels | <input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified | |
| III. Performance Acceptance | 1. Safety device testing (emergency stop, limit) | <input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified | |
| | 2. No abnormal operation (abnormal noise/vibration) under no-load condition | <input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified | |
| | 3. Energy consumption indicators (e.g.,) | <input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified | |
| | 4. Environmental emissions (noise/leakage) | <input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified | |
| Acceptance Conclusion | <input type="checkbox"/> Qualified, approved for storage <input type="checkbox"/> Unqualified, requiring return/replacement (Reason:) | | |
| Signature Confirmation | Head of Equipment Management Department: Date: | | |

Appendix C: Work Permit (Template) (For Equipment Installation/Overhaul)

| | | | |
|--------------------|---|-----------------|---|
| Work No. | | Work Type | <input type="checkbox"/> Installation <input type="checkbox"/> Overhaul <input type="checkbox"/> Hot Work <input type="checkbox"/> High-Altitude Work |
| Equipment for Work | | Work Location | |
| Work Time | Hour of Year Month Day - Hour of Year Month Day | Work Supervisor | |

| | | | |
|------------------------------|---|--------------------------|------|
| Risk Identification | 1. ; 2. ; 3. | | |
| Control Measures | 1. ; 2. ; 3. | | |
| Protective Equipment | <input type="checkbox"/> Safety Helmet <input type="checkbox"/> Safety Belt <input type="checkbox"/> Goggles <input type="checkbox"/> Protective Clothing <input type="checkbox"/> Gas Detector | | |
| Emergency Measures | 1. ; 2. | Emergency Contact Person | Tel: |
| Approval Opinion | Maintenance Team Leader: Date: HSE Supervisor (for High-Risk Work): Date: | | |
| Work Completion Confirmation | Equipment Status: <input type="checkbox"/> Normal <input type="checkbox"/> Abnormal Confirmation Person: Date: | | |

Appendix D: HSE Acceptance Report for Installation and Commissioning (Template) (Omitted, integrate content of Appendix B and add energy consumption and environmental protection acceptance items)

Appendix E: Equipment Operation Qualification Certificate (Template) (Omitted, same as original Appendix C)

Appendix F: Daily Inspection Form for Equipment and Facilities (Template)

| | | | | | |
|-----------------|----------------|----------------|--|---------------|--|
| Inspection Date | Year Month Day | Equipment Name | | Equipment No. | |
| Operator | | Team | | | |

| Inspection Item | Inspection Content | Inspection Standard | Inspection Result (<input type="checkbox"/> Normal <input type="checkbox"/> Abnormal) | Abnormal Description/Disposal | |
|-------------------------------------|---|---|--|-------------------------------|--|
| Appearance Status | No deformation, no leakage, no looseness | Complete parts, no oil dripping | | | |
| Safety Devices | Emergency stop, limit, guardrail | Normal function, firm and reliable | | | |
| Instrument Display | Oil level, pressure, temperature, energy consumption | Within normal range, valid instrument calibration | | | |
| Operation Status | No peculiar smell, no abnormal noise, no vibration | Stable operation, noise \leq dB | | | |
| Electrical System | Insulation, grounding, cables | No damage, grounding resistance $\leq 10\Omega$ | | | |
| Environmental Protection Facilities | No leakage, operation indicator light | Normal operation, no excessive emissions | | | |
| Inspection Conclusion | <input type="checkbox"/> Approved for normal use <input type="checkbox"/> Approved for use after | | | | |

| | | | | | |
|-----------|--|--|--|--|--|
| | maintenance <input type="checkbox"/> Prohibited from use | | | | |
| Signature | Operator: Team Leader Review: Date: | | | | |

**Appendix G: HSE Ledger for Equipment Operation (Template)
(Omitted, same as original Appendix E, add energy
consumption record items)**

Appendix H: Annual Preventive Maintenance Plan (Template)

| Equipme nt Type | Equip ment Name | Mainten ance Level | Mainten ance Cycle | Mainten ance Content | Mainten ance Standar d | Respon sible Depart ment | Expecte d Energy Consum ption Indicato r | Rem arks |
|---------------------------|-----------------------|--------------------------|--------------------------|---|---|-----------------------------------|--|-------------|
| Hoisting Machine ry | Bridge Crane | Daily | Weekly | Cleanin g, limit inspecti on | Sensitiv e limit | Mainten ance Team | - | |
| | | Regular | Monthly | Lubricat ion, bolt fastenin g | No loosene ss, sufficie nt lubricati on | Mainten ance Team | - | |
| | | Overha ul | Annual | Load testing, safety access ory | Qualifie d testing, valid | Third- Party | Energy consum ption ≤ | |

| | | | | | | | | |
|------------------------------------|---------------------|---------|-----------|------------------------------------|-----------------------------------|--------------------|-------------------------------|--|
| | | | | calibration | accessories | | | |
| Environmental Protection Equipment | Oil-Water Separator | Daily | Daily | Level inspection, slag discharge | Normal level, no blockage | Warehousing Center | - | |
| | | Regular | Quarterly | Filter cleaning, chemical addition | Clean filter, sufficient chemical | Maintenance Team | Treatment efficiency \geq % | |

Appendix I: HSE Record for Equipment Maintenance (Template) (Omitted, same as original Appendix H, add energy consumption verification items)

Appendix J: HSE Permit for Equipment Overhaul Operation (Template) (Integrate content of Appendix C Work Permit, refine overhaul-specific requirements)

Appendix K: Equipment Fault Report (Template)

| | | | |
|-----------------------|------------------------|---------------------|--|
| Report No. | | Report Date | Year Month Day |
| Equipment Name | | Equipment No. | |
| Fault Occurrence Time | Hour of Year Month Day | Occurrence Location | |
| Operator | | Impact Scope | <input type="checkbox"/> Single Equipment <input type="checkbox"/> Production Line <input type="checkbox"/> Environmental Emission |
| Fault Phenomenon | 1. ; 2. ; 3. | | |

| | | | |
|----------------------------|---|--|--|
| Preliminary Cause Analysis | | | |
| Measures Taken | 1. Shutdown; 2. ; 3. | | |
| Handling Suggestions | 1. ; 2. ; 3. | | |
| Approval Opinion | Maintenance Team Leader: Date: Equipment Management Department: Date: | | |
| Handling Result | Completion Time: Handler: Effect: <input type="checkbox"/> Normal <input type="checkbox"/> Abnormal | | |

Appendix L: HSE Application for Equipment and Facilities Modification (Template)

| | | | |
|---|--|---------------------|----------------|
| Application No. | | Application Date | Year Month Day |
| Application Department | | Applicant | |
| Equipment Name | | Equipment No. | |
| Modification Type | <input type="checkbox"/> Structural <input type="checkbox"/> Parameter <input type="checkbox"/> Control <input type="checkbox"/> Safety & Environmental Protection | Modification Reason | |
| Modification Content (Original Status → New Status) | 1. ; 2. ; 3. | | |
| Summary of Modification Plan | (Attach detailed plan/drawings) | | |

| | | | |
|-------------------------|---|--|--|
| Risk Assessment Result | Risk Level: <input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low Control Measures: 1. ; 2. | | |
| Approval Opinion | Equipment Management Department: Date: In-Charge Leader (for Major Modifications): Date: | | |
| Modification Acceptance | Acceptance Date: Acceptance Result: <input type="checkbox"/> Qualified <input type="checkbox"/> Unqualified Acceptor: | | |

Appendix M: Operation Ledger for Environmental Protection Facilities (Template)

| Date | Equipment Name | Treatment Capacity (m ³ /h) | Operation Parameters (e.g., Chemical Dosage) | Emission Test Result (Qualified/Excessive) | Maintenance Record | Operator |
|------|----------------------|--|--|--|--------------------|----------|
| | Oil-Water Separator | | | | | |
| | Exhaust Gas Purifier | | | | | |

Appendix N: Hazardous Waste Disposal Ledger (Template)

| Date | Waste Type | Generation Quantity (kg) | Storage Location | Disposal Unit | Disposal Method | Disposal Waybill No. | Handler |
|------|------------|--------------------------|------------------|---------------|-----------------|----------------------|---------|
|------|------------|--------------------------|------------------|---------------|-----------------|----------------------|---------|

| | | | | | | | |
|--|--------------|--|--|--|---------------------|--|--|
| | Waste Oil | | | | Recycling | | |
| | Waste Filter | | | | Innocuous Treatment | | |

Appendix O: HSE Hazard Rectification Ledger for Equipment and Facilities (Template) (Omitted, same as original Appendix I)

Appendix P: HSE Application for Equipment and Facilities Scrapping (Template) (Omitted, same as original Appendix J, add energy consumption assessment items)

Appendix Q: Safety Management Requirements for Special Equipment

Q.1 Boilers and Pressure Vessels

- Complete and valid use registration certificates and regular inspection reports;
- Safety accessories (safety valves, pressure gauges) calibrated periodically (safety valves once every 6 months);
- Operators hold *Special Operation Operation Certificates*; overpressure and overtemperature operation are prohibited;
- Establish operation records (pressure, temperature, liquid level); shut down immediately in case of abnormalities.

Q.2 Hoisting Machinery

- Clear rated load marking; overloading is prohibited;
- Complete and valid safety devices (limit, braking, buffer); daily inspection;
- Qualified regular inspection (once a year); establish maintenance records;
- Conduct JSA analysis before operation; set up warning zones.

Q.3 Pressure Pipelines

- Complete use registration certificates and non-destructive testing reports;
- Regular inspection (once every 6 years); corrosion monitoring once a year;
- No leakage at valves and flanges; establish patrol records;

- Regular testing of emergency shut-off valves (once a quarter).

Appendix R: HSE Management Process for Equipment and Facilities

graph TD

A[Design and Selection (HSE Review)] --> B[Procurement and Acceptance (HSE Compliance)]

B --> C[Installation and Commissioning (Work Permit + Acceptance)]

C --> D[Operation and Use (Procedure + Pre-Shift Inspection)]

D --> E[Maintenance (Preventive + Overhaul)]

E --> F[Fault Handling (Root Cause Analysis)]

D --> G[Modification Management (Risk Assessment + Approval)]

E --> H[Inspection and Testing (Regular + Compliance)]

D --> I[Environmental Protection and Energy Conservation (Emission Monitoring + Energy Consumption Control)]

H --> J[Scrapping and Disposal (HSE Assessment + Compliance)]

D --> K[Emergency Management (Plan + Drill)]

F --> L[Continuous Improvement (Procedure Revision + Training)]

G --> L

8 Supplementary Provisions

8.1 This procedure shall be interpreted by the Company's Equipment Management Department.

8.2 This procedure shall come into force on the date of issuance. In case of any inconsistency between the existing HSE management regulations for equipment and facilities and this procedure, this procedure shall prevail.

8.3 This procedure shall be revised once a year, or updated in a timely manner according to changes in national laws and

regulations, CNPC/Pipeline Bureau management requirements and Company business.

8.4 For matters not covered in this procedure, refer to the *Equipment and Facilities HSE Management Specifications* and relevant laws and regulations.