



SSHE

Security, Safety, Health & Environment



SECURITY SAFETY HEALTH ENVIRONMENT



PTT Group SSHE Management Standards

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Security, Safety, Health and Environment Department (SSHE)

PTT Group SSHE Management Standards

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I. INTRODUCTION

1. Message from the President and Chief Executive Officer

As PTT Group works toward making our Vision and Mission a reality within CSR Framework; Care Share Respect, PTT Group is committed to operate responsibly through implementation our SSHE management system in line with international standards whilst balancing our contribution to the benefits of society, employees and communities with an unwavering dedication to our core values of SPIRIT; Synergy, Performance Excellence, Innovation, Responsibility for Society, Integrity & Ethics and Trust and Respect.

PTT is aiming to develop an organization that advances in science and technology which can help the environment; Technologically Advanced and Green National Oil Company (TAGNOC). TAGNOC's purpose is to drive the business based on technology and knowledge. Instead of just relying on natural resources, PTT has developed Green Products which will hopefully help become an alternative energy to build a sustainable energy future. Coupled with investments in oil and natural gas which is today's the main energy source and is gradually being depleted everyday.

PTT Group owns and operates a diverse range of businesses in different countries and cultures that, by their nature, may affect the health and safety of people and the environment. Our approach to Security, Safety, Health and Environment (SSHE) stimulates our strong financial performance as well as corporate reputation. Our financial achievements are coupled with a firm commitment to provide value to our stakeholders, create a positive working environment for our employees, help the well-being of our communities, and protect the environment.

As we continue to evolve in a disciplined manner, an improved management of SSHE has become increasingly important. SSHE for PTT Group is an imperative for ensuring our long-term success.

The SSHE Management Standards form the basis for the development and application of SSHE management systems at all levels in PTT Group. Although SSHE matters are interrelated and co-dependent, it is recognized that the skills and processes required to manage issues may vary according to the context. The scope of these standards covers all operational aspects and activities that have the potential to affect, positively or negatively, the health and safety of people or the environment. They cover the entire life cycle of operations, from exploration and planning through to operation, closure, and decommissioning.

Our Management Standards help us manage our operations in an environmentally and socially responsible manner, while allowing for flexibility and innovation at the business and facility levels. The standards are locally relevant while providing value to the business across our operations.

We must continue strengthening our commitment to SSHE and improving our performance to realize our vision of being "Thai Premier Multinational Energy Company". I encourage you to develop your SSHE knowledge and skills, adopt and apply these Management Standards. By doing so, you will be creating a company that is safer, more efficient and environmentally sound.



President and Chief Executive Officer
PTT Group

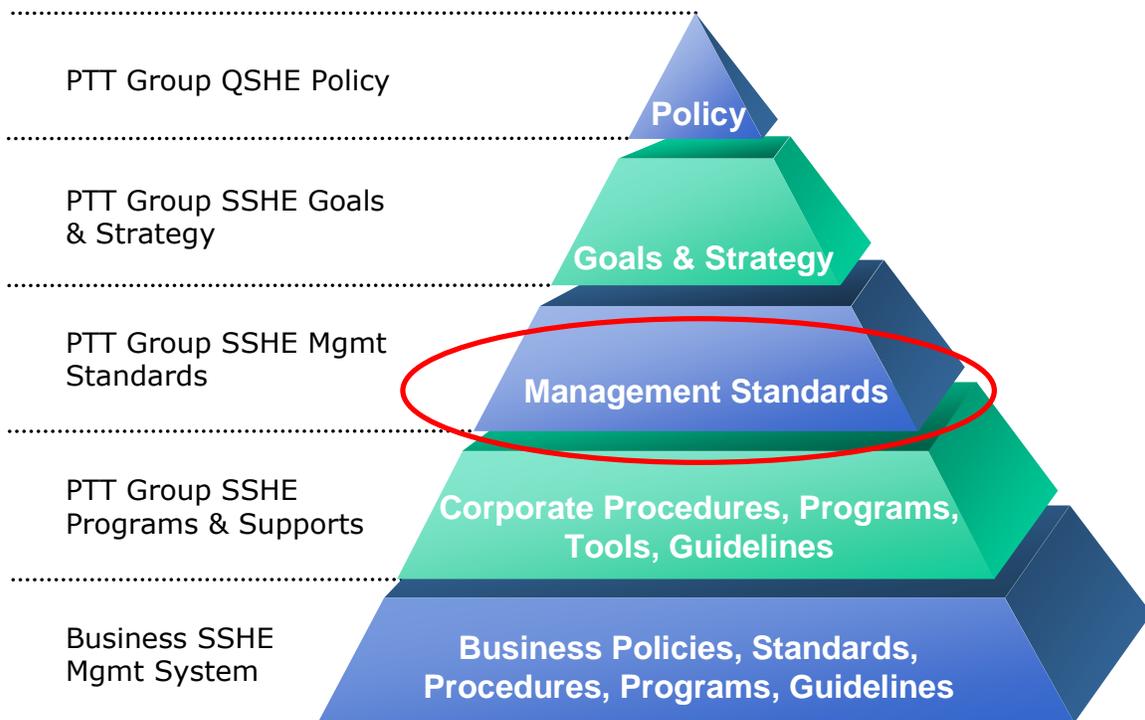
2. Purpose and Overview of SSHE Management Standards

The PTT Group SSHE Management Standards define a set of minimum requirements for all PTT Group businesses. Endorsed by PTT Group President and CEO, conformance with these standards will help PTT Group carry out its QSHE policy, manage SSHE risks and impacts, comply with applicable legal requirements, and continuously improve our SSHE performance.

The corporate SSHE Management Standards connect the corporate QSHE policy to business-specific SSHE management policies, standards, and procedures as illustrated in Figure 1.

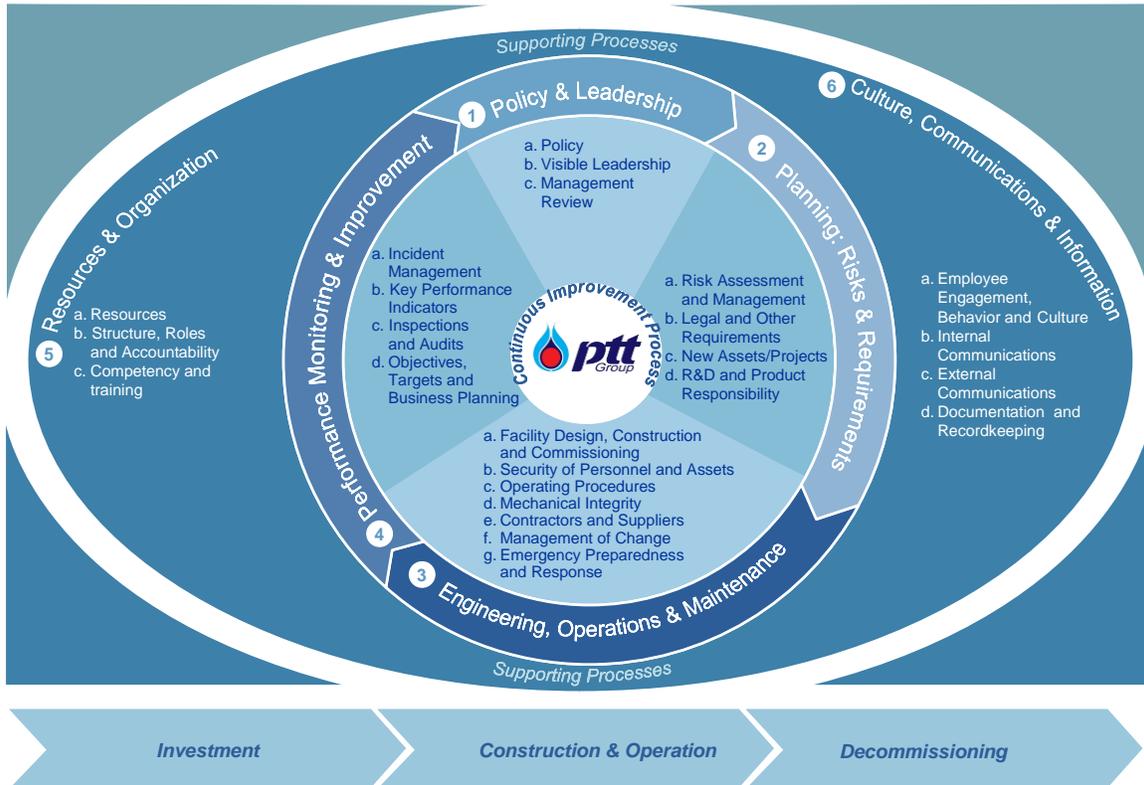
The management standards are organized in the framework illustrated in Figure 2 below, a familiar plan-do-check-act continuous improvement cycle, consistent with internationally recognized SSHE management standards (e.g. ISO 14001, OHSAS 18001, PSM, and ISO 28000). The framework includes 6 elements, 25 sub-elements and 119 discrete requirements. They were developed based on the above international standards, existing management systems being implemented within the business, best management practices demonstrated by other major international energy companies, and the management framework used by the Thailand Quality Awards – but customized specifically for PTT Group.

Figure 1 – Document Hierarchy



PTT Group SSHE Management Standards

Figure 2 – PTT Group SSHE Management Standards Framework



Conformance to these standards is to be achieved by mapping existing SSHE management programs, processes and procedures to the expectations outlined in this document. These standards were designed to be flexible and accommodate a range of practices that may be equivalent with the intent of the standards. Where gaps exist between current practices and these management standards, business and operations will be expected to take action to close the gaps over time. Conformance with these standards shall be verified by Corporate SSHE.

The specific requirements that make up these management standards are found in Section III of this document. There will be a series of Corporate management procedures and guidelines that illustrate how all of these requirements will be met.

II. QSHE Policy

Quality, Security, Safety, Health and Environment (QSHE) are vital elements of PTT Group's business. We believe that QSHE excellence through continual performance improvement directly supports our organization effectiveness and business sustainability.

Consistent with our core value, PTT Group is seeking to establish a common QSHE culture where our people understand and uncompromisingly manage SSHE risks in their working environment.

We are all committed to:

- 1) Comply with all applicable SSHE laws and regulations and our internal and industrial standards as a minimum performance achievement level.
- 2) Prevent accidental losses, and promote the health of our workforce, community and the stakeholders. Protect our people, assets, information from threats by risk assessment and determine security measures with respect to Universal Declaration of Human Rights
- 3) Control, Prevent, and Reduce the SSHE Risks including the protection of ecosystems and biodiversity based on pollution prevention principle, green house gases management for low carbon society and energy efficiency improvement in all activities since project startup through decommissioning.
- 4) Research, develop, and provide safe and green products to ensure our customers know how to use them properly throughout the products' lifecycle.
- 5) Implement management systems and promote the use of supporting tools consistent with PTT Group QSHE Management Framework.
- 6) Engage and communicate with internal and external stakeholders regarding our QSHE programs and performance.
- 7) Focus on total quality management throughout the organization with the effective working process in order to deliver products and services to gain customer's satisfaction.

This policy applies to all PTT Group businesses and operations across supply chains. Executive Management is accountable for policy alignment. All management shall express their visible leadership in QSHE. All employees shall understand and comply with this policy throughout their activities including process and product design as well as business process.

III. SSHE MANAGEMENT STANDARDS

1. POLICY AND LEADERSHIP

- a. **Policy** – *SSHE performance expectations are clearly defined and understood to guide day-to-day behaviors and decision-making*
 - 1. Issue corporate QSHE policy signed off by President and Chief Executive Officer and Top Management of PTT Group subsidiaries
 - 2. Businesses adopt corporate policy or implement a customized one that is consistent with and does not contravene the corporate policy
 - 3. Communicate policy to all employees so that its intent is understood
 - 4. Make policy available to external stakeholders
 - 5. Review and update policy at least on an annual basis or where appropriate
- b. **Visible Leadership** – *Management's commitment to the policy and SSHE performance is visible to all employees, helping to build/reinforce the SSHE culture and drive program implementation*
 - 1. Incorporate SSHE programs and performance in routine management meetings
 - 2. Allocate adequate resources to implement policy and supporting management systems
 - 3. Set performance improvement goals and drive implementation of defined action plans
 - 4. Participate in SSHE initiatives (e.g. training, inspections, corrective action follow-up from audits and incident investigations)
 - 5. Issue periodic communications that demonstrate their commitment to SSHE performance
 - 6. Provide coaching and support to other management and staff in implementing SSHE programs
 - 7. Model behaviors that support the SSHE performance improvement and hold others accountable to do the same
 - 8. Recognize, reinforce and reward SSHE innovation, initiatives, desired behaviors and outcomes
- c. **Management Review** – *Overall SSHE program and performance are reviewed by senior management to ensure it is achieving the desired outcomes in a cost-effective manner*
 - 1. Conduct formal review on the adequacy and effectiveness of SSHE management standards, programs and performance at least on an annual basis. Information reviewed includes audit results (including internal and external audits), incident reports, objectives and targets, and relevant views from stakeholders
 - 2. Develop and implement improvement actions based the results of the management reviews

2. PLANNING: RISKS AND REQUIREMENTS

a. Risk Assessment and Management – *Hazards are identified and associated risks are assessed based on the controls in place, and actions are taken to mitigate risks to a level as low as reasonably practicable (ALARP)*

1. Identify and document SSHE hazards associated with all existing assets, operational equipment and work activities, including potential impacts to employees, contractors, community and the environment, considering discrete equipment and tasks, as well as interfaces between and across them
2. Identify and document the controls in place to manage identified hazards
3. Assess risk and determine whether risk is acceptable
4. Implement actions to mitigate unacceptable risk and reduce risk to a level that is as low as reasonably practicable
5. Ensure risk assessments are carried out by competent individuals (including external Subject Matter Experts as needed)
6. Review risk assessment at least annually and update as needed
7. Conduct risk assessments per Management of Change requirements, including changes to the organization, operations, equipment, business processes, materials and products and services

b. Legal and Other Requirements – *Relevant laws, regulations and other SSHE requirements are identified, accessible, understood and complied with.*

1. Identify and document applicable laws, regulations, compliance requirements, and other commitments made to stakeholders
2. Define actions required to comply with identified requirements, and assign and communicate actions to responsible employees and contractors
3. Incorporate compliance actions into a compliance calendar or similar action tracking tool to track completion of compliance actions
4. Monitor changes to compliance requirements on an ongoing basis or at least annually and incorporate new requirements into the compliance management process (items 2b1-2b3)
5. Track emerging issues and legal requirements that may impact our business and operations, and participate in the formulation of public policy where strategically relevant, according to SSHE risks

c. New Assets/Projects – *SSHE due diligence is conducted as part of new assets/project mergers or acquisition, and environmental, social and health impact assessment is conducted for all new and modified facilities.*

1. Conduct SSHE due diligence prior to acquiring or divesting assets and incorporate management of identified SSHE risks and liabilities into the transaction
2. Phase in PTT Group policies and standards into newly acquired assets as soon as practicable
3. Conduct environmental, health and social impact assessment through the implementation of corporate Project Review Process

PTT Group SSHE Management Standards

4. Incorporate results of impact assessment and related SSHE performance improvement opportunities into project design, ensuring regulatory compliance and mitigating adverse impacts to people and the environment
- d. R&D and Product Responsibility – *The lifecycle SSHE impacts associated with products are minimized and managed.***
1. Identify, assess and manage significant safety, health and environmental risks across the lifecycle (including raw material production and transportation, manufacturing, storage, distribution, transportation, use, recycling, potential release and disposal) of PTT Group's products
 2. Incorporate personal, public and environmental health and safety considerations into the design of company products and services
 3. Communicate the SSHE hazards and associated safe use and disposal practices to potential customers
 4. Provide mechanisms for customers to provide feedback on our products and services so they can be incorporated into future designs
- 3. ENGINEERING, OPERATIONS AND MAINTENANCE**
- a. Facility Design, Construction and Commissioning – *SSHE risks of all projects are managed through design, approval, construction, and commissioning.***
1. Incorporate assessment of potential SSHE impacts, risks and opportunities in design reviews throughout the project development process (e.g. conceptual design, detailed design, prior to construction) and modify designs as needed to ensure regulatory compliance and mitigate potential adverse impacts to people and the environment
 2. Address potential risks and liabilities associated with the ultimate decommissioning of new facilities during the design stage
 3. Identify and document equipment and systems that are critical to regulatory compliance and effective management of SSHE risks in a critical equipment register. The register should at minimum include all critical equipment, codes and applicable standards, design function (including operating limits), a unique identification, required performance standards (e.g. minimum reliability), and maintenance requirements
 4. Review and approve the critical equipment register by the designated authority. Deviation from the approved codes, standards, or design function, is permitted after the review and approval by the designated authority
 5. Incorporate management of SSHE risks into the construction management plan
 6. Apply the SSHE management system framework during the construction phase (e.g. training, inspections, operating procedures, incident management)
 7. Conduct pre-startup review on all new, modified or previously idled facilities to ensure regulatory compliance and effective management of SSHE risks
- b. Security of Personnel and Assets – *A secure environment is provided to ensure business continuity.***
1. Promote security awareness and cautions to the security environment
 2. Cooperate with community and external resources to gain intelligence to protect our people, asset, operation and reputation from threats

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3. Develop and implement risk-based Security Management Plan to address potential security threats to the business
 4. Integrate security management plans with related plans for emergency management, business continuity and information protection
 5. Conform to the PTT Security Management Guidelines
- c. Operating Procedures** – *Documented procedures, including work permit are in place for managing SSHE risks.*
1. Develop and apply operating procedures and supporting work instructions (including design data and operating limits) to address regulated SSHE hazards and other potentially significant SSHE risks for normal and abnormal conditions (including planned start-up and shutdown)
 2. Monitor operating criteria and implementation of operational controls to anticipate and prevent non-compliance and adverse impacts
 3. Implement specific procedures to address emergency start-up and shutdown
 4. Implement permit-to-work procedures to address specific high-risk tasks
 5. Implement powered motor vehicle safety procedures which include specifications on safety features and equipment requirements, training and competency of operator, vehicle standard operating procedures, maintenance and inspections
 6. Train employees and contractors on relevant operating procedures so they are effectively implemented
- d. Mechanical Integrity** – *All plant and equipment are operated and maintained to sustain mechanical integrity and prevent incidents.*
1. Identify and document equipment, including operating equipment, control equipment and measurement devices, critical to achieving commitments defined in QSHE Policy.
 2. Conduct preventive maintenance on the critical equipment, consistent with design specifications and to keep the equipment running in proper operating condition
 3. Ensure the critical equipment that fails or is not operating properly receives immediate repair and is verified prior to use as required
 4. Maintain and analyze records of equipment performance to anticipate and address performance issues
- e. Contractors and Suppliers** – *The management of SSHE risks associated with goods and services provided by contractors and suppliers is carried out to minimize any adverse SSHE consequences.*
1. Identify and assess SSHE risks associated with goods and services provided by contractors and suppliers prior to contractual arrangements being established, taking into account of SSHE management programs and previous performance
 2. Incorporate SSHE performance requirements into the selection of contractors and suppliers
 3. Establish and enforce contracts that address potential SSHE liability and responsibility for contractors and suppliers on a risk basis, including consequences for failing to comply with contract or regulatory obligations

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4. Make relevant contractors and suppliers, including their employees and associated subcontractors, aware of SSHE risks, associated controls, procedures and standards relevant to their work
 5. Contractors and suppliers provide information on the hazards associated with their equipment, products and services, prior to delivery or commencement of works, and whenever changes occur
 6. Monitor and report contractor and supplier activities and performance relative to the SSHE provisions in the contracts established
- f. Management of Change** – *Changes are identified and managed to ensure that risks arising from these changes remain at an acceptable level.*
1. Implement and maintain a documented change management process that defines the level of risk assessment required to assess the potential SSHE impacts from both permanent and temporary changes to the plant and equipment, land use, materials/chemicals, operational and business processes, resources and organization
 2. Conduct risk assessments of proposed changes, considering potential implications for SSHE performance; and ensure competent staff are involved in the risk assessment
 3. Agree on modifications to existing controls or other actions to mitigate SSHE risks prior to authorizing the change
 4. Obtain all new permits or necessary modifications to existing regulatory permits and implement actions to mitigate risks and ensure compliance prior to implementing the change.
 5. Document the changes made, including maintenance of “as built” drawings and new or modified procedures
 6. Communicate these changes to relevant personnel
- g. Emergency Preparedness and Response** – *Plans and procedures are in place to effectively respond to emergency situations.*
1. Identify emergency scenarios, including credible worst case and establish emergency preparedness and response plans and procedures to mitigate SSHE and associated business impacts
 2. Implement and maintain crisis communications plans to inform stakeholders in the event of an actual emergency
 3. Organize and train local response teams, deploy and maintain appropriate response equipment, and maintain coordination with external response organizations in line with established plans
 4. Conduct emergency and crisis management exercises including preparedness, response and recovery at least annually
 5. Respond to actual emergency scenarios in a manner that prevents or mitigates adverse SSHE impacts
 6. Review and modify emergency preparedness and response plans and procedures based on lessons learned from exercises and responses to actual emergencies

4. PERFORMANCE MONITORING AND IMPROVEMENT

a. Incident Management – *SSHE incidents are reported, investigated and analyzed. Corrective and preventive actions are taken and learning shared.*

1. Take immediate actions to mitigate the impact of an incident
2. Report incidents (spills, permit violation, injuries, fires, complaints, property damage, etc.) in a timely manner
3. Conduct investigations to identify the root causes and contributing factors to determine where improvements in the systems, processes, practices and procedures are required. Incident investigations should be carried out by competent individuals and at a level commensurate with the actual or potential magnitude of impact
4. Develop and implement corrective and preventive actions to reduce the likelihood of a recurrence
5. Track completion of corrective and preventive actions through closure and report to line management
6. Analyze incident trends and take proactive measures to reduce incident frequency and severity
7. Share lessons learned from incidents with relevant stakeholders

b. Key Performance Indicators – *SSHE KPIs are established and tracked to drive continual improvement in performance.*

1. Define specific indicators to measure SSHE performance, including leading and lagging indicators; indicators should reflect applicable legal requirement, impacts, risks and business priorities
2. Track and report performance indicators to line management, including PTT Group SHE Performance Measurement and Reporting Protocols
3. Take corrective actions to address adverse trends in performance as appropriate

c. Inspections and Audits – *SSHE performance and systems are audited to assess conformance and drive continual improvement.*

1. Implement inspection programs to identify and prevent potential non-compliance with legal and other SSHE requirements on a day-to-day basis
2. Conduct internal audits of compliance with relevant laws, regulations and other SSHE requirements by qualified persons at least annually
3. Conduct periodic internal and corporate audits against these management standards. Performance improvement plans are prepared and executed to address non-conformities. Selection of auditors shall ensure competency, objectivity and the impartiality of the audit process
4. Communicate results of inspections and audits to responsible line management
5. Implement corrective and preventive actions to address the immediate and root causes of the inspection and audit findings
6. Track completion of corrective and preventive actions through closure
7. Analyze inspection and audit results and take proactive measures to improve compliance performance

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d. Objectives, Targets and Business Planning – *SSHE objectives and targets are established to drive continual improvement in performance.*

1. Develop objectives and measurable goals to improve SSHE performance, considering policy, past performance, risks and opportunities, industry benchmarks, interests of stakeholders and business realities
2. Develop action plans to achieve the defined goals, including specifying responsibilities, timeframe and resource requirements
3. Incorporate the goal-setting and action planning process in the business planning process, so they are aligned with the business, endorsed by management and resourced

5. RESOURCES AND ORGANIZATION

a. Resources – *Sufficient resources are provided to support effective SSHE management, the implementation and maintenance of SSHE management standards.*

1. Allocate adequate resources essential to implement policy and support management systems, including established goals and action plans. Resources include human resources and specialized skills, organizational infrastructure, technology and financial resources
2. Implement best available technology reasonably achievable

b. Structure, Roles and Accountability – *SSHE roles and accountabilities of employees and contractors are defined, documented, communicated, and kept up-to-date.*

1. Define, document and communicate SSHE roles so they are clearly understood by responsible individuals, including SSHE management representative(s) who is responsible for facilitating the ongoing implementation of the SSHE management standards
2. Hold responsible individuals accountable for carrying out their roles and achieving the desired results through performance appraisal and incentive compensation processes where appropriate
3. Cascade accountability down from senior management down through first line supervisors and operators
4. Establish disciplinary action processes (e.g., for gross negligence or intentional harm)

c. Competency and Training – *Process is in place to ensure that employees and contractors are competent to conduct their activities and behave in a responsible manner.*

1. Establish SSHE competencies for key positions (including facility managers and SSHE professional staff)
2. Incorporate SSHE competencies, awareness, behaviors and performance in the hiring and promotion processes (including all levels of operations/line management)
3. Define training needs for all key positions, including contractors (where relevant) and new and transferring staff; training needs should consider applicable legal requirements, general SSHE awareness, and specialized skills specific to the hazards and controls associated with each job
4. Provide SSHE leadership training to all managers

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5. Implement training programs consistent with the training needs defined, ensuring all staff are competent to effectively carry out assigned responsibilities

6. CULTURE, COMMUNICATIONS AND INFORMATION

a. Employee Engagement, Behavior and Culture – *SSHE behavior and culture is built and continuously improved through workforce engagement.*

1. Engage employees in the design and implementation of SSHE programs, including at staff/department meeting and shift changes, as well as through Safety Committee meetings, surveys, suggestion boxes, safety promotion program, or other mechanisms as appropriate
2. Follow SSHE rules and regulations and encourage others to adhere to them
3. Establish authority of employees to stop work if conditions are unsafe
4. Give right to employees to refuse unsafe work assignment
5. Emphasize employee responsibility to identify, report and correct unsafe and unsecured conditions and behaviors

b. Internal Communications – *Effective, transparent and open communication is maintained with employees and contractors.*

1. Implement communication programs, covering topics such as the QSHE policy, hazards and controls, performance accomplishments and opportunities for improvement, to increase awareness and promote innovation and continuous improvement
2. Share best practices, knowledge and lessons learned within the organization and PTT Group
3. Establish a mechanism is in place that allows employees and contractors to suggest improvement opportunities and report SSHE concerns anonymously and without fear of reprisal

c. External Communications – *Mechanisms are in place to communicate our SSHE programs and performance to external interested parties.*

1. Implement a process to document and respond to external inquiries regarding SSHE performance; including from regulators, neighbors, customers, investors, business partners and other stakeholders
2. Communicate SSHE programs and performance to external interested stakeholders

d. Documentation and Recordkeeping – *An effective management system is in place to manage SSHE document and record essential to assess and manage risks.*

1. Maintain documentation that describes the core elements of SSHE management standards and their interaction, including indexes or maps that provide direction to related documents
2. Maintain current process flow charts and piping and instrumentation diagrams, information on the potential hazards of materials involved in process, including documents pertinent for sound operation and maintenance of process
3. Implement document and record management procedures to ensure current versions of information and data are readily available, obsolete versions are removed and to control confidential information

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4. Maintain readily available records that demonstrate regulatory compliance and conformance to the requirements of these management standards

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IV. DEFINITIONS

Accident	An event that results in unintended harm or damage.
Audit	Systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which “audit criteria” set by the organization are fulfilled. The audit criteria may include SSHE regulatory requirements, management system procedures, management standards, etc.
Change	A deviation, either permanent, temporary, or incremental, from a currently established baseline, or anything that is or may be substituted for something else. This includes changes to personnel, processes, systems, plant and equipment, technology, documents, risks, legislation, commitments, obligations, other requirements, and external environmental, physical and social factors affecting or affected by the organization.
Continual improvement	A process of enhancing performance and management systems, not necessarily in all areas simultaneously.
Contractor	An individual, company or other legal entity that carries out work or performs services on behalf of PTT Group, pursuant to a contract for service.
Corporate procedure	Defined approach to carry out an activity or a process from Corporate SSHE.
Corrective action	An action implemented to eliminate the cause of a non-conformance or incident in order to prevent recurrence. The corrective action is commensurate with the magnitude of the non-conformance or incident.
Crisis	An emergency where the situation has escalated to the point where there is actual or potential media interest which might have a negative impact on business, operation, reputation at the corporate level and could threaten the survival of the business. Mitigation by strategic management is immediately needed.
Crisis communication	Many of the expected harmful individual and community behaviors can be mitigated with effective crisis and emergency risk communication. The practitioner must anticipate what mental stresses the population will be experiencing and apply appropriate risk communication strategies to attempt to manage these stresses in the population. Risk communication is a fully legitimate tool of response and recovery just like any other resource applied to the disaster. It is not an attempt at mass mental therapy. It is a reasoned and mature communication approach to the selection of message, messenger, and method of delivery.
Critical equipment	A piece of equipment or a structure whose failure, or not performing to design specification, has the potential to result in a Major Accident Event (e.g. fatality, serious environmental effects, including impairment of ecosystem function, ongoing significant social issues, significant adverse attention from national media or non-government organisations (NGO), or loss of licence to operate).
Discrete elements	The detailed requirements issued under the sub-element.
Elements	The article of management framework. Examples of management system elements include Policy and Leadership; Planning: Risks & Requirements; Engineering, Operations & Maintenance; and Performance Monitoring and Improvements, etc.
Emergency scenario	An immediate occurrence, that can pose a threat to health, life, asset or environment, which requires urgent action to minimize, cease and recover to normal situation as soon as possible.
Goal	A long-term strategic position that has been established that must be attained to satisfactorily manage an SSHE issue.
Hazard	Source, situation, or act with a potential for harm in terms of human injury or ill health, or a combination of these. Also hazards, in these Management Standards, include an

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element of an organization's activities or products or services that can interact with the environment.

Incident	An unexpected event that occurs and subsequently causes accident, near-miss, threat to security or impact to the environment.
Inspection	A comprehensive survey of all or part of a workplace in order to detect SSHE hazards. Inspections are normally performed during the regular work hours of the agency, except as special circumstances may require. Inspections do not include routine workplace surveillance of occupational health conditions.
ISO 14001	ISO 14001 is an international standard, which specifies the requirements of an environmental management system. The ISO 14001 standard is based on the plan-do-check-act cycle.
ISO 28000	The international standard that specifies requirements for a security management system, including those aspects critical to security assurance of the supply chain. Security management is linked to many other aspects of business management. Aspects include all activities controlled or influenced by organizations that impact on supply chain security. These other aspects should be considered directly, where and when they have an impact on security management, including transporting these goods along the supply chain. (Specification for Security Management System for the Supply Chain)
Lagging indicator	A measurement of the impact of organization's activities, particularly when things go wrong.
Leading indicator	A measurement of inputs to performance (i.e. those things that are managed in order to prevent things going wrong). It indicates the effectiveness of the management system and the degree of its implementation.
Likelihood	A description of probability or frequency, in relation to the chance that something will occur.
Management of change	A systematic process for addressing SSHE risks arising from proposed change(s).
Management standard	Minimum requirements for all PTT Group businesses and form the basis for the development and application of SSHE management systems at all levels of PTT Group.
Management system	Management processes and documentation that collectively provide a systematic framework for ensuring that tasks are performed correctly, consistently and effectively to achieve a specified outcome and to drive continual improvement in SSHE performance. A systematic approach to management requires: an assessment of what needs to be done; planning to achieve the objective; implementation of the plan; and review of performance in meeting the set objective. A management system also considers employees and contractors, and resource and documentation requirements.
Non-compliance	Failure, act or state of not complying with regulatory requirements and other SSHE requirements the organization subscribes to.
Non-conformity	Non fulfillment of a requirement or a deviation from a standard. When an organization fails to meet requirements or deviates from a standard, non-conformity exists. Accordingly, any deviation from PTT Group SSHE management standards is considered a non-conformity
OHSAS 18001	OHSAS 18001 is an international standard, which specifies the requirements related to health and safety management systems. It enables an organization to have control over, and knowledge of, all relevant hazards resulting from normal operations and abnormal situations, and improve its performance.
Powered motor vehicles (PMVs)	Mobile, power-propelled trucks used to carry, push, pull, lift, stack, or tier materials. They are also commonly known as forklifts, pallet trucks, tractors, platform lift trucks, motorized hand trucks, rider trucks, forktrucks and liftrucks. These PMVs do not include transporting vehicles used for transporting raw materials and products outside a boundary of the organization.

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Practicable	The extent to which actions are technically feasible, in view of cost, current knowledge and known best practices.
Preventive action	An action implemented to prevent the occurrence of a potential non-conformance or incident. The preventive action is commensurate with the severity of the potential non-conformance or incident.
Project development process	Conceptual design, detailed design, prior to construction.
PSM	Process Safety Management
PTT Group businesses	All activities, products and services under PTT Group from exploration & production, procurement and distribution, transmission, processing, and marketing of natural gas and international trading of oil and petrochemical products, investment in petrochemical and refining businesses in Thailand and domestic and oversea investment in related businesses. Core business groups are Upstream Petroleum and Gas Business Group; and the Downstream Petroleum Business Group.
Record	A document that shows what kinds of activities are being performed or what kind of results is being achieved. It always documents and provides evidence about the past.
Risk	The risk of an activity/product/service is the product of likelihood of an impact on the SSHE of people, the environment, the community or property, and the severity of that impact. A significant risk is a risk that results in or has the potential to result in a significant SSHE impact.
Risk assessment	The systematic evaluation of the degree of risk posed by an activity or operation. The process of using the results of risk analysis to rank and/or compare them with acceptable risk criteria or goals.
SSHE	Security, Safety, Health and Environment.
Stakeholder	Any person or group that may be affected by the financial or safety, health, environment and community performance of PTT Group or its operations. Stakeholders may include: employees, contractors, suppliers, the Board of Directors, shareholders, investment analysts, lending and other financial institutions, governments and government departments, neighbors of our operations and minority groups.
Sub-elements	The requirements issued under management system elements. Examples of sub-elements in Policy and Leadership, Risk Assessment and Management, etc.
Subject Matter Expert	Subject Matter Expert or SME is a competent individual having a combination of attributes such as knowledge, skills, abilities and attitudes providing adequate assurance of successful performance on a particular subject. SME maybe in-house personnel or external resources.
Substandard acts and substandard conditions	Acts or conditions that do not meet established standards; frequently referred to as unsafe acts or conditions
Tool	Practical assistance in meeting the requirements of these standards and procedures.
UNUDHR	The United Nations Declaration of Human Rights is the first comprehensive set of minimum standards on human rights to be signed up to by all governments in the United Nations (UN) and adopted by the General Assembly on 10 th December 1948 including Thailand.

V. APPENDICES

1. Frequently Asked Questions
2. Roles and Responsibilities
3. Comparison to ISO 14001:2004
4. Comparison to OHSAS 18001:2007
5. Comparison to OGP
6. Comparison to PSM

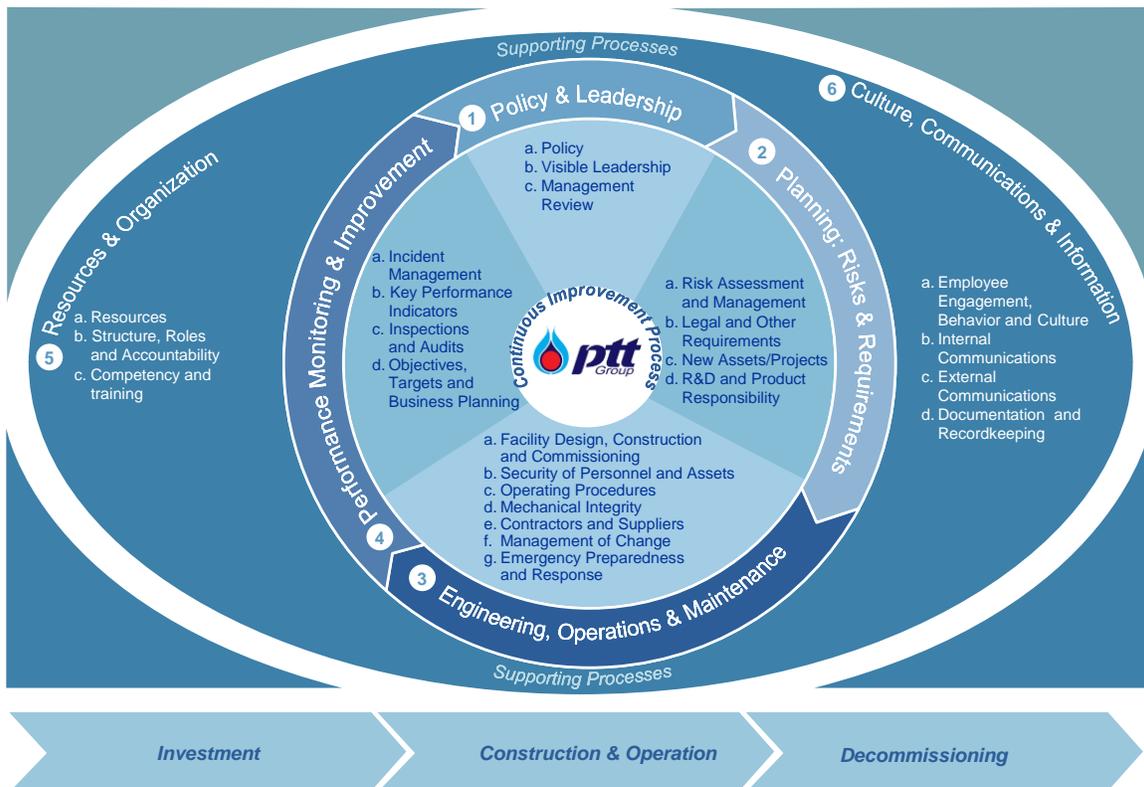
Appendix 1 – Frequently Asked Questions

What is the PTT Group Corporate SSHE Management Standard?

Security, Safety, Health and Environment (SSHE) Management Standards prescribe the minimum expectation for businesses and facilities and supporting functions to achieve the commitments of the QSHE Policy. It will act as a framework to provide order and consistency for incorporating SSHE responsibilities into PTT Group's business. It is designed to ensure that effective processes are in place to identify and manage SSHE risks and achieve ongoing improvement to associated performance.

What are the key elements of the Corporate SSHE Management Standards?

SSHE Management Standards contains 6 core elements, 25 sub-elements (illustrated in the figure below), applied throughout the company's entire business value chain (investment, construction & operation, and decommissioning). These elements are part of a system thus they are inter-related. The standards are designed on the principles of *Plan, Do, Check, Act* components of a management system. The core requirements of SSHE Management Standards include:



1. Policy and Leadership

Policy and Leadership define, communicate and illustrate commitments of senior management to foster a culture grounded in SSHE management; which also spell out the requirement to implement a regular review of SSHE performance.

PTT Group SSHE Management Standards

2. Planning

Planning comprises risk assessment; access to regulatory requirements and SSHE due diligence as part of new assets/ project mergers or acquisition; including SSHE management of product life-cycle.

3. Engineering, Operations and Maintenance

SSHE risks are managed through design, construction, commissioning, and operation under PTT Group's operation control including suppliers and contractors; maintenance and emergency preparedness and responses in order to mitigate the SSHE impacts.

4. Performance Monitoring and Improvement

Performance Monitoring and Improvement details the requirements to implement SSHE performance monitoring and auditing; corrective and preventive actions; sharing of lessons learned and best practices including the establishment of SSHE goals and targets to drive continual improvement in SSHE performance.

5. Resources and Organization

Resources and Organization seeks to build and maintain the company's capability to manage SSHE issues by defining roles, responsibilities, accountabilities and competencies of resources to support effective SSHE management.

6. Culture, Communications and Information

Culture, Communications and Information continuously foster SSHE engagement; model the SSHE behavior and culture; communicate internally and externally to interested stakeholders; defines documentation and record keeping approach.

Why were the Corporate SSHE Management Standards developed?

- Build understanding and manage SSHE risks to reduce impacts from operation on people, community, economies and to sustain business operations.
- Communicate minimum SSHE expectations throughout the value chain to business and supporting functions in order to drive implementation through robust management system.
- Build a culture where collaboration is fostered across corporate level, SSHE representatives at business, enabling SSHE personnel to share knowledge and expertise in risk management and maximize SSHE performance in order to pursue SSHE excellence.
- Adopt consistent approach in managing the SSHE risks across the group to create value and enhance performance for functional, business and corporate levels i.e. emergency management, incident management and reporting.

What are the benefits of implementing the Corporate SSHE Management Standards?

Effective implementation of Corporate SSHE Management Standard will create tangible business value for the company, at all levels (i.e. facility, business and corporate). For example:

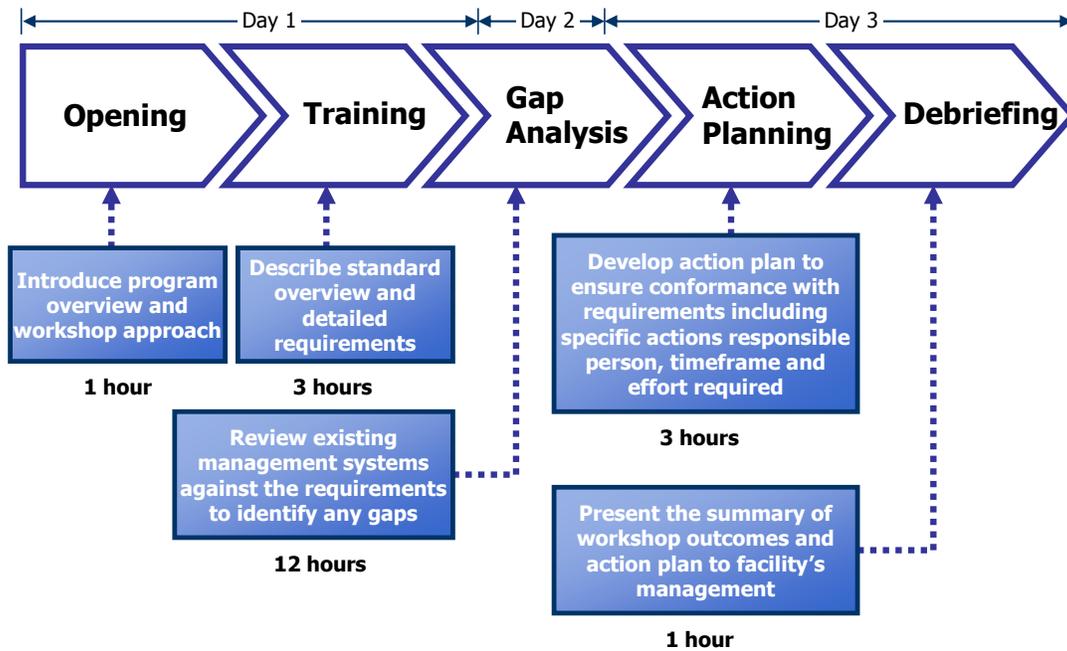
- Proactively identify and mitigate risks to continually improve SSHE performance
- Seek acceptance by stakeholders and increase business capability to expand and have greater access to capital
- Optimize strength and gain competitive advantages
- Embed SSHE culture as part of day-to-day job
- Build expertise, collaboration and knowledge sharing in SSHE across the group.

PTT Group SSHE Management Standards

How do I implement the Corporate SSHE Management Standards?

The implementation of the Corporate SSHE Management Standards comprises three (3) core steps i.e. training on SSHE MS requirement, gap analysis and action planning. The mentioned steps will help the facility define and develop the specific action plan to ensure conformance with the standard requirements. The details of each step are elaborated in the SSHE MS Implementation Manual.

In addition, PTT Group has also developed SSHE Guidelines for all facilities to adopt or use as guidance for further implementation in accordance with PTT Group's expectation. Such guidelines include SSHE Risk Management, Management of Change, Contractor and Supplier Management, Incident Management, Emergency Preparedness and Response, SSHE Management System Audit and Security Management.



Who is responsible for implementing the Corporate SSHE Management Standards?

SSHE Management Standard implementation will involve various functions within each facility, including operations, maintenance, engineering, procurement, planning, human resources, security, CC/CSR, and SHE staff. However, there will be one key person – the site SSHE Management Lead – who will be responsible for coordinating the implementation. There are also designated Business Unit SSHE Management Coordinators that will be responsible for coordinating SSHE Management Standard implementation in their respective Business Unit. However, accountability for results is fundamentally a line responsibility. As such, the Facility Managers and Business Unit Head are primarily accountable for the successful implementation of Corporate SSHE Management Standards.

How can I get help for SSHE Management Standard implementation?

There are several resources available to help operating locations with SSHE Management Standard implementation. At the initial site implementation launch, for example, trained Business Unit SSHE Management Facilitator(s) will be available to answer questions and provide support for SSHE Management Standard implementation. In some cases, representatives from Corporate may also be available to provide support during the SSHE Management Standard facility launch. There is also a Corporate SSHE Management Toolbox which will provide guides and templates for addressing potential SSHE Management Standard gaps (refer to next question).

PTT Group SSHE Management Standards

Are my existing management systems compatible with SSHE Management Standards (e.g. ISO 14001, ISO 9001, ISRS, OHSAS 18001, SHE Mgmt as per OGP Guideline)?

PTTG SSHE Management Standards are designed to be compatible with ISO, PSM, OGP and related international management systems standards and current PTTG SHE programs (e.g. SHE Performance Measurement Systems). It is also designed to be flexible and to leverage existing business processes already in place. If your facility has implemented one of the ISO systems or another system, you may already comply with significant portions of management standards. In this case, the management standards will help you to improve your ability to manage other issues not already addressed by existing systems -- e.g., beyond ISO.

Appendix 2 – PTT Group SSHE Management Roles and Responsibilities

President and CEO

- Provide visible leadership and strategic direction regarding SSHE expectations
- Issues the PTTG QSHE Policy
- Endorse Group-wide goals in support of the policy
- Hold senior leaders accountable for their implementation of the QSHE Policy and SSHE Management Standards

PTT Management Committee

- Approve major SHE initiatives, including corporate SSHE standards and large capital projects
- Review SSHE program and resulting performance at least on an annual basis and drive improvement action as needed

Corporate SSHE

Policies and Standards

- Propose Group SSHE policies and standards for approval by the Management Committee
- Develop and provide guidance on policies and standards, including training materials

Strategy and Planning

- Develop and communicate SSHE strategic plan
- Execute elements of the SSHE strategy plan specific to Corporate SSHE
- Propose corporate SSHE goals for approval by the management committee and goals

Regulatory Tracking and Advocacy

- Monitor emerging SSHE legislation/regulations and issues
- Participate in public policy development with respect to SSHE emerging issues (in coordination with Business)

Emergency Management

- Establish corporate-level contingency/crisis management plans
- Coordinate relationships with external emergency response organizations as agreed with the BUs
- Participate in investigations of major incidents

Mergers, Acquisitions and Divestitures

- Conduct SSHE due diligence for mergers, acquisitions and divestitures outside the scope of existing business structures
- Integrate newly acquired plants / business outside the scope of existing business structures so they conform with corporate SSHE management standards

Cross-division and cross-functional coordination

- Coordinate SHE Policy Committee
- Facilitate sharing of best practices and lessons learned across businesses
- Manage intranet SHE site and related enterprise SSHE IT applications (e.g., incident reporting)
- Integrate SSHE into core corporate business processes of other functions (e.g., supply chain, organizational development, capital authorization, product development, risk management)

External Communications

- Support CSR in managing SSHE content on corporate external website
- Support CSR in publishing corporate public CSR report
- Support CSR in external communications that protect and enhance reputation
- Respond to SSHE information requests from external stakeholders (in coordination with the BUs and Investor Relations)

Assurance and Management Reporting

- Establish corporate key performance indicators
- Develop SSHE balanced scorecard

PTT Group SSHE Management Standards

- Understand relevant SSHE material liabilities
- Maintain awareness of significant SSHE incidents in the businesses
- Implement corporate audit program
- Compile company-wide performance data and produce routine internal management reports
- Propose improvement actions based on company-wide performance data

Others

- Provide leadership and communications to raise visibility/awareness and build corporate SSHE culture
- Provide subject matter expertise in key areas and services to BU on request

PTT SHE Policy Committee

- Work with Corporate SHE to propose and refine SSHE initiatives designed to improve SSHE performance across the Group
- Coordinate SSHE program implementation across business to optimize efficiency and effectiveness
- Ensure sharing of best practices and lessons learned across the Group
- Review Group SSHE performance to identify potential improvement opportunities and propose potential improvements to the Management Committee
- Debate and agree on responses to emerging issues and regulations of strategic importance to the company
- Guide and inform the Management Committee's strategic decisions that involve SSHE risks, opportunities, and issues integral to business decisions, business practices and financial results

Business

Policies and Standards

- Provide input during the development of corporate policies and standards
- Develop and implement complementary BU standards as needed in support of the corporate standards
- Provide train and communications on relevant corporate (and BU) standards to functions/staff
- Implement corporate standards within the BU in a manner that best fits the business

Strategy and Planning

- Participate in Corporate SSHE strategic planning process
- Develop and deploy BU-specific SSHE strategic plan that reflects BU-specific SSHE risks and opportunities, reflects best industry practices, and aligns with BU business plan and Corporate SSHE plan
- Set BU (and site) specific goals, to complement corporate SSHE plan and goals
- Participate in BU-level annual business planning process to ensure resources are allocated to implement BU SSHE strategic plan

Organization

- Define SSHE roles of various departments and positions across the BU
- Ensure those with SSHE roles are competent to carry them out
- Hold line management accountable for SSHE performance
- Provide leadership and communications to raise visibility/awareness and build SSHE culture within the BU

Regulatory Tracking and Advocacy

- Identify and document all applicable legal requirements that apply to the BU's operations, activities and products
- Track changes to legal requirements that apply to the BU's operations, activities and products
- Coordinate with Corporate SSHE on public policy development advocacy

Compliance and Risk Management

- Conduct risk assessments of equipment, processes and work activities to determine adequacy of controls to manage risk
- Obtain permits and registrations to ensure regulatory compliance
- Implement compliance programs and day-to-day operating procedures and work instructions to manage compliance (regulation and internal standards) and risk

PTT Group SSHE Management Standards

- Implement and maintain facilities and equipment to effectively manage compliance and risk
- Conduct local inspections to verify housekeeping, compliance with procedures and regulations, and effective management of SSHE risk
- Conduct environmental, health and social impact assessment (EHSIA) studies, including public consultation
- Conduct management of change to ensure continued compliance and risk management

Emergency Management

- Implement plans and deploy appropriate resources to prevent and respond to potential emergency situations specific to BU operations and activities
- Lead emergency response effort in the event of an emergency associated with BU operations or activities
- Coordinate with local response organizations
- Represent the company in external communications
- Lead incident investigations and implementation of corrective and preventive actions

Mergers and Acquisitions and Divestitures

- Conduct SSHE due diligence for investment/property transactions by the business
- Integrate newly acquired plants and assets into the BU so they conform with corporate and BU SSHE requirements

Cross-division and cross-functional coordination

- Participate as a member of the SHE Policy Committee
- Facilitate sharing of information, best practices and lesson learned within the BU to optimize programs and performance
- Identify best practices and lesson learned for sharing with other businesses
- Maintain BU-specific intranet sites (where appropriate)
- Integrate SSHE into core BU business processes of other functions (e.g., supply chain, organizational development, capital authorization, product development, risk management)

External Communications

- Provide information and data in support of the corporate external website and corporate public CSR report
- Support CSR in managing SSHE content on BU external website
- Support CSR in publishing BU public CSR report
- Conduct local stakeholder engagement and consultation specific to individual plants and projects
- Respond to SSHE information requests from local external stakeholders (in coordination with corporate SSHE and CSR as needed)
- Conduct public consultation in support of EHSIA studies

Assurance and Management Reporting

- Collect and report corporate KPIs per corporate requirements
- Develop complementary KPIs specific to the business, as needed, and report KPI results to BU management
- Conduct audits to verify compliance with regulations and internal (corporate and BU) standards
- Take corrective action to address performance issues (resulting from review of KPIs, results of audits, etc.)
- Incorporate SHE content into BU balanced scorecard

Corporate Strategic Planning

- Incorporate SSHE issues into the development of company-wide business strategy
- Work with Corporate SSHE and Business to ensure that SSHE due diligence is carried out for acquisitions and divestitures and strategic sourcing process, and that the results are factored into the business transaction

Corporate Supply Chain/Procurement

- Incorporate SSHE performance, programs and issues into the strategic sourcing process, including the selection and management of contractors and suppliers

PTT Group SSHE Management Standards

Corporate R&D

- Incorporate SSHE issues into the design and development of company products and services
- Cooperate with Business to develop hazard/control information on products for communication to potential/actual customers

Corporate Communications and CSR

- Coordinate with the relevant Business and Corporate SSHE to appropriately respond to inquiries and complaints from interested external parties, including ensuring approvals are secured before communicating with external stakeholders or publishing SSHE information
- Provide information on SSHE programs, performance and issues to internal audiences to help maintain a high level of employee awareness (in coordination with Corporate SSHE)
- Lead in developing and approving the SSHE content of Corporate CSR Reports (in coordination with Corporate SSHE)

Corporate Legal

- Maintain an understanding of legal requirements that apply to PTT Group's businesses
- Represent the company's strategic response to third-party claims and non-compliance negotiations with regulators in coordination with the relevant business area, Corporate SSHE and others, as appropriate
- Establish and enforce contracts that address potential SSHE liability and responsibility for contractors and suppliers on a risk basis (in coordination with Supply Chain/Procurement and the Business)
- Provides appropriate internal and external legal resources in defending corporate and BUs in matters related to SSHE litigation, as well as stakeholder negotiation of legal matters that affect existing assets, mergers and acquisitions, divestitures and new asset development and construction

Corporate Human Resources/Organization Development

- Support individual Business and operations in ensuring SSHE roles and responsibilities are clearly defined and understood across organizational levels and departments
- Support individual Business and operations in ensuring responsible individuals are held accountable for carrying out their assigned responsibilities
- Support individual Business and operations in ensuring appropriate awareness, education and training is provided to all relevant segments of the workforce -- including at hiring, promotion, job transfer, and operating process changes
- Helps ensure that any person performing actions on behalf of individual Business and operations that can impact SSHE performance is competent on the basis of appropriate awareness, education, training or experience

PTT Group SSHE Management Standards

Appendix 3 – Comparison to ISO 14001:2004

ISO 14001:2004 Environmental Management System Requirements	PTTG SSHE Management Standard Requirements
4.2 Environmental Policy	II, 1 (a)
4.3.1 Environmental Aspects	2 (a)
4.3.2 Legal and Other Requirements	2 (b)
4.3.3 Objectives, Targets and Program	4 (d)
4.4.1 Resources, Roles, Responsibility and Authority	5 (a, b)
4.4.2 Competence, Training and Awareness	5 (c)
4.4.3 Communication	6 (b, c)
4.4.4 Documentation	6 (d)
4.4.5 Control of Documents	6 (d)
4.4.6 Operational Control	3 (c)
4.4.7 Emergency Preparedness and Response	3 (g)
4.5.1 Monitoring and Measurement	4 (b)
4.5.2 Evaluation of Compliance	4 (c)
4.5.3 Nonconformity, Corrective Action and Preventive Action	4 (c)
4.5.4 Control of Records	6 (d)
4.5.5 Internal Audit	4 (c)
4.6 Management Review	1 (c)
“Beyond” ISO 14001	1 (b), 2 (c, d), 3 (a, b, d, e, f), 4 (a), 6 (a)

Appendix 4 – Comparison to OHSAS 18001:2007

OHSAS 18001:2007 Occupational Health and Safety Management Systems – Requirements	PTTG SSHE Management Standard Requirements
4.2 OH&S policy	II, 1 (a)
4.3.1 Hazard identification, risk assessment and determining controls	2 (a)
4.3.2 Legal and Other Requirements	2 (b)
4.3.3 Objectives and programme(s)	4 (d)
4.4.1 Resources, roles, responsibility, accountability and authority	5 (a, b)
4.4.2 Competence, Training and Awareness	5 (c)
4.4.3 Communication, participation and consultation	6 (b, c)
4.4.4 Documentation	6 (d)
4.4.5 Control of Documents	6 (d)
4.4.6 Operational Control	3 (c)
4.4.7 Emergency Preparedness and Response	3 (g)
4.5.1 Performance measurement and monitoring	4 (b)
4.5.2 Evaluation of Compliance	4 (c)
4.5.3 Incident investigation, nonconformity, corrective action and preventive action	4 (a, c)
4.5.4 Control of Records	6 (d)
4.5.5 Internal Audit	4 (c)
4.6 Management Review	1 (c)
“Beyond” OHSAS 18001	1 (b), 2 (c, d), 3 (a, b, d, e, f), 6 (a)

Appendix 5 – Comparison to OGP

OGP	PTTG SSHE Management Standard Requirements
1 Leadership and commitment	1 (b)
2 Policy and strategic objectives	II, 1 (a), 4 (d)
3.1 Organizational structure and responsibilities	5 (b)
3.2 Management representative(s)	5 (b)
3.3 Resources	5 (a)
3.4 Competence	5 (c)
3.5 Contractors	3 (e)
3.6 Communication	6 (b, c)
3.7 Documentation and its control	6 (d)
4.1 Identification of hazards and effects	2 (a)
4.2 Evaluation	2 (a)
4.3 Records of hazards and effects	2 (a)
4.4 Objective and performance criteria	4 (b)
4.5 Risk reduction measures	2 (a)
5.1 General (Planning)	-
5.2 Asset integrity	3 (a, d)
5.3 Procedures and work instructions	3 (c)
5.4 Management of change	3 (f)
5.5 Contingency and emergency planning	3 (g)
6.1 Activities and tasks	-
6.2 Monitoring	4 (b)
6.3 Records	6 (d)
6.4 Non-compliance and corrective action	4 (c)
6.5 Incident reporting	4 (a)
6.6 Incident follow-up	4 (a)
7.1 Auditing	4 (c)
7.2 Reviewing	1 (c)
“Beyond” OGP	2 (b, c, d), 3 (b), 6 (a)

Appendix 6 – Comparison to PSM

PSM	PTTG SSHE Management Standard Requirements
Management of Leadership	
Employee Participation	6 (a)
Incident Investigation	4 (a)
Compliance Audit	4 (c)
Management of Technology	
Process Safety Information	Limited
Process Hazard Analysis	2 (a, c), 3 (a)
Operating Procedures	3 (c)
Management of Change	3 (f)
Trade Secret	6 (d)
Management of Facilities	
Emergency Planning & Response	3 (g)
Pre-startup Safety Review	3 (a)
Mechanical Integrity	3 (d)
Management of Personnel	
Training	5 (c)
Contractor	3 (e)
Hot-work Permit	Limited



-  **Security**
-  **Safety**
-  **Health**
-  **Environment**

Security, Safety, Health and Environment Department (SSHE)

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