


# ตัวอย่างการติดตามตรวจสอบ และซ่อมบำรุงของเจ้าหน้าที่

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		<b>CLEAN UP BURNER CHECKLIST</b>		DATE: 6-2-22	
		<b>MECHANICAL ENGINEERING DOCUMENT</b>		LOCATION: WONE-C3	
				Doc No. TK-026	
PROJECT NO.		AREA		Revision	0
TAG NO.		SYSTEM		Sheet	

**Checking Procedure:**  
 1) Prepare permit to work and necessity facilities to work  
 2) Prepare equipment which is used for work preventive maintenance  
 3) Onsite PM practice by recognising & strict to HSE commandment  
 4) Take recording the inspection results in the lost as table below  
 5) Check the work area clean and tidy then call to Production Operator sign close permit to work document

JOB TASK	INSPECTED	
	YES	NO
1 Take off burner housing from tank	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2 Check and clean up fire tube	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3 Check and clean up burner gun	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4 Check and clean up pilot gun	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5 Reinstall burner housing to tank	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6 Check leaks and adjust fire	<input checked="" type="checkbox"/>	<input type="checkbox"/>



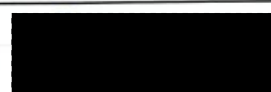

**Remark:**  


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TEST / VERIFIED BY	FOREMAN WITNESS BY	ENGINEER WITNESS BY	ENDORSED BY
 DATE: 6-2-22	 DATE:	 DATE: 6/2/22	 DATE:

ภาคผนวก จ-3

การฝึกอบรมด้านอาชีพอนามัยและความปลอดภัย

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## Summary Inhouse Training 2022

หลักสูตร ดับเพลิงเบื้องต้น

วันที่ 14 มีนาคม 2565



หลักสูตร ผู้ควบคุมงาน ผู้ให้สัญญาณ และผู้ปฏิบัติหน้าที่เกี่ยวกับปั้นจั่น

วันที่ 29 เมษายน 2565



ทบทวน นโยบายความปลอดภัย ขั้นตอนการทำงานอย่างปลอดภัย การใช้ความเร็ว ในการขับเคลื่อนอย่างปลอดภัย สำหรับพนักงานขับรถบรรทุกน้ำมันดิบ

วันที่ 28 พ.ค 2565 , 4 และ 9 มิ.ย 2565







ทบทวน นโยบายความปลอดภัย ขั้นตอนการทำงานอย่างปลอดภัย การใช้ความเร็ว ในการขับขี้อย่างปลอดภัย พนักงานขับรถบรรทุกน้ำจาก  
กระบวนการผลิต  
วันที่ 29 พ.ค 2565 , 5 มิ.ย 2565



อบรม ความปลอดภัยในการทำงานเกี่ยวกับสารเคมี การจัดเก็บ และการเก็บกู้  
วันที่ 27 มิ.ย 2565



ภาคผนวก จ-4  
ระบบบริหารอาชีวอนามัย ความปลอดภัย  
และสิ่งแวดล้อม

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## ECO ORIENT ENERGY (THAILAND) LTD ECO ORIENT RESOURCES (THAILAND) LTD

# Health Safety Environment MANAGEMENT SYSTEM

REVISION STATUS				
Rev	Date	Description	Originator	Approved
0	25 July 2013	First Working Version	HSE Manager	General Manager

	Document / Rev No:	ECO-HSE-001-Rev 0
Health Safety and Environment	Revision Date:	25 July 2013
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### Document Issue Record

Position	Location	Copy No	Issue Date
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ECO HSE	Hong Kong	02	
All BKK Staff	Bangkok Server	03	
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### FOREWORD

ECO Orient Energy (Thailand) Limited and ECO Orient Resources (Thailand) Limited ("The Company") recognizes that effective health, safety and environment management contributes significantly to its long-term business success.

This document sets out The Company's social and environmental management system. It emphasizes the systematic approach to the way we manage our business activities and our belief that our performance can always be improved over time. The integration of social responsibility and environmental protection into our day-to-day activities is the key to successful management.

The realization and success of this system requires the participation and commitment of management, employees and contractors at all levels.

This policy and management system has the Board's full support but we require your commitment through a personal understanding of this document and full participation in the effective implementation of the system.

It is imperative that everyone involved in the business of The Company familiarize themselves with their roles and responsibilities in this document. Only by total commitment by everyone can we ensure the best possible protection of our personnel, contractors, the public, our assets and the environment.

Signed:



General Manager

Date: 25 July 2013

### Area of Application

The policies and associated Safety Management System (SMS) apply to the activities of ECO Businesses in Thailand.


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## Safety Management System

### ECO ORIENT Energy (Thailand) Ltd ECO ORIENT Resources (Thailand) Ltd

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#### Section 1: Introduction

The management of health and safety and the protection of the environment, by industry in Thailand, has evolved along with technological and management change. This Health Safety and Environment Management System (SMS) provides a **structured** approach to the way we manage safety and environmental issues. It identifies individual responsibilities in respect of who does what, when and how against policy, objectives and business activities to ensure the creation, implementation and maintenance of safe systems of work in a safe working environment.

##### 1.1 This Document

The SMS represents the Company's corporate management standards for health, safety and environmental management performance. It includes the underpinning standards and instructions referred to in the document and listed in the Document Management System in Appendix 1. The structure of The Company's SMS documentation is illustrated in Appendix 2.

Implementation of the SMS will result in the health safety and environmental risks arising from the Company's activities, being effectively managed, to ensure that they are reduced to **as low as reasonably practicable (ALARP)**. This will also ensure **compliance** with all the relevant statutory requirements applying to the Company.

The SMS is a controlled document and the custodian is the **General Manager**. It will be reviewed periodically with the assistance of HSE Manager.

##### 1.2 Background to Health, Safety and Environment Management

The Company will strive for world class HSE performance at its operations in Thailand. The company's Management Team and Board of Directors all bring with them experience from larger international Operating companies. This experience will be employed at its operations in the creation and maintenance of a fit-for-purpose HSE Management System.

##### 1.3 The HSE Management Model

The Health Safety and Environmental management model, based on HSG 65, is illustrated in Figure 1. The aim is not only to provide effective policies and procedures but also to incorporate the necessary management control systems to ensure that they are being applied correctly. Improving performance is achieved by management monitoring and feedback. The **Risk Assessment** process (See Section 4.2) compliments the overall HSE policy.

##### 1.4 The HSE Management Principles

###### Policy and Objectives:


The Company's Health, Safety and Environmental Policy (see Section 2.0) sets out the overall statement of policy along with its objectives for health and safety management.

###### Organizing:

The effective implementation of the management system requires a clear company organizational structure, with staff at all levels committed to the implementation and having an understanding of all the following requirements to achieve success:

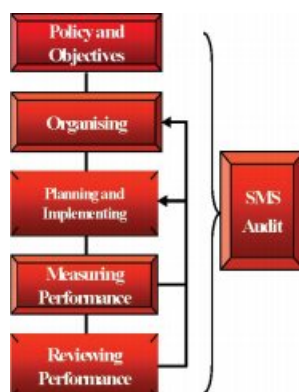
- an explicit organizational structure
- identification of safety critical activities & resultant tasks

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- ensuring personnel are competent to carry out assigned tasks
- clearly defined roles, responsibilities and accountabilities
- distinct lines of communication
- effective management and integration of contractors.


Figure 1: The POPMAR Management Model



#### Planning and Implementing:

**Planning** for safety and environmental protection involves the identification of The Company's business activities and identifying the associated hazards, risks and control measures required. For the major safety critical activities, the hazards and risks associated with the activity are identified, controls defined, performance standards set and roles, responsibilities and competency standards defined.

**Implementation** takes the results of the planning phase and puts in place the systems, controls, procedures and performance measures to eliminate or control identified hazards and risks. As required by health and safety legislation, wherever possible, risks are eliminated by the use of engineering controls through selection and design of facilities and equipment and through physical control measures. Where risks cannot be eliminated in this ways, then safe systems of work, selection, training and competence of individuals and occupational health measures, including personal protective equipment, are used.

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#### Measuring and Reviewing Performance

HSE performance measurement is based on the comparison of actual performance against the standards for each key activity. Performance is also assessed by the analysis of SMS audits, planned inspections and incident statistics. Performance is fed back to management and used as part of the performance review process.

**Management of Health Safety and Environment** is the day-to-day responsibility of managers and supervisors. Their own HSE commitment and performance will be the **major influence on the success in achieving the Company's objectives**. This involves **them monitoring the standards of performance of hardware, systems and personnel**.


The objective of monitoring is not only to identify sub-standard performance but also to determine the underlying causes and implications. This allows for action plans to be developed and through their implementation, the improvement in safety performance.

#### Audit

Auditing is a structured and formal process for the evaluation of the implementation and effectiveness of the overall SMS against the laid down objectives, goals and performance standards.

Audit is an independent review of the SMS, including each of the key elements. The auditor assesses how the system complies with The Company's requirements, and compares the SMS with accepted industry standards.




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Section 2: HSE Policy & Objectives



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### Section 3: Organization and Responsibilities:

#### 3.1 Management Structure and Organization Chart

The effective implementation of the HSE Management System requires a clear company organizational structure, with staff at all levels understanding their respective roles and lines of communication together with their commitment to its implementation.

The continuing success of the Company and its subsequent growth has called for reorganization, as shown in Figure 2.

The major changes have been applied to the field operations which is organized to bring greater focus on meeting the Company's production volume targets, as well as driving ownership down into the organization.

#### 3.2 Personnel Responsibilities

Each employee within the Company has a role to play with regards to health, safety and environment. Personnel at all levels are required to understand their respective roles and responsibilities within the HSE Management System and be committed to implementation of this system as specified in this document.

##### 3.2.1. Senior Management

###### General Manager

The General Manager has ultimate responsibility for the performance of the Company and is in charge of developing the organization and controls to achieve the corporate objectives to ensure that all activities under his control are conducted in compliance with the relevant statutory provisions. The General Manager is also responsible for providing direction and guidance for all business activities and for safeguarding and communicating Company's principles and policy on HSE ensuring that the necessary resources are provided and that appropriate actions are taken to effectively implement and maintain the requirements of the HSE Management System.

###### Production Manager

The Production Manager oversees the Field Management Team and reports to the General Manager. He is responsible for upholding the implementation of the HSE procedures and delegating responsibility to Production Team Leaders and Senior engineers ensuring they are competent and capable of carrying out their work to the required standard. The Production Manager's primary role is to:

- Account for production, sales and the proper disposal of all waste fluids streams (gas and water), as required by local regulations.
- Motivate staff, promote their growth and fully participate in the career planning and competence development process including HSE training;

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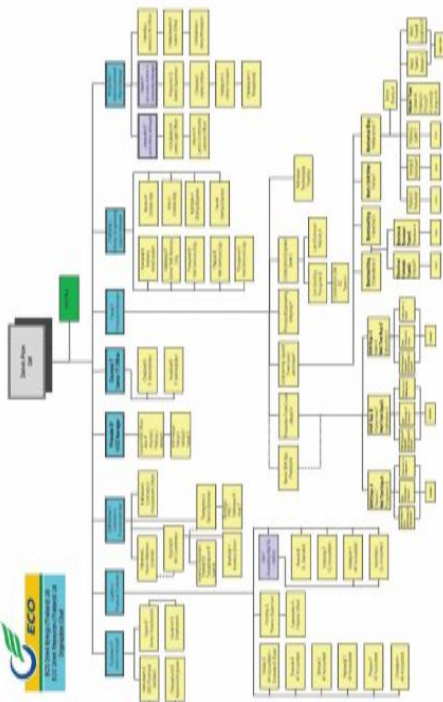

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Figure 2: Organization Chart June 2013



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- Ensure appropriate management controls and processes for operations activities (including HSE) are established and deployed in an effective and efficient manner and regularly appraised in order to achieve objectives and reach targets.
- Develop and implement HAZOPs plans;
- Comply with Thai Regulations and other relevant industry standards.

###### Drilling Manager

Drilling operations are controlled by the Drilling Manager. The site location will determine which Asset this comes under. The Drilling Manager is directly responsible to ensure all industry standards specified in the Company's HSE procedures are being applied and HSE policy and procedures cascaded down to subordinates and contractors. Other HSE responsibilities include:


- In coordination with the HSE Manager and Asset HSE Officer, performing frequent site checks on processes, equipment, rig working conditions and HSE standards.
- The supervision of contractors in applying the required procedures for safe operations with regards to all drilling activities especially blowout prevention; handling and storage of hazardous substances such as chemicals, radio-active sources and disposal of hazardous waste.
- Perform regular safety drills to ensure emergency preparedness.
- Responsibility in case of an emergency and initiate all required actions in accordance to the emergency response procedures.

###### HSE Manager

The HSE Manager assisted by the Asset HSE Officers is accountable for establishing a good environment, safe and healthy workplace by monitoring the standards, communications, training, processes and systems to ensure the HSE Management System is effectively implemented and that performance levels are aligned with the Company's HSE targets and objectives. The key enabling functions to achieve this are:

- Provision and promotion of suitable information concerning HSE policies and practices;
- Establishing HSE objectives and targets and monitoring performance;
- Ensuring all activities are performed in accordance with the HSE Management System meeting all the goals, standards and as required by law;
- Preparation and consultation with personnel on improving HSE standards, standing instructions and safe operating procedures;
- Prevention, precautions and adequate control against exposure to hazardous substances and danger from flammable, explosive, electrical, noise, radiation and equipment handling risks;
- Provision and supervision of emergency exercises, first-aid facilities, safety signs, relevant protective clothing and equipment, and incident reporting to the relevant authorities;
- Liaison and consultation with organizations and relevant authorities for assistance and cooperation in HSE issues;
- Participation and development of HAZOPs / corrective action plans and ensuring follow up and close out.

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### 3.2.2 Field Management Team

#### Production Team Leader and Engineering Support Team Leader

Both Team Leaders has total responsibility for all HSE issues and coordinating with the Support Team to supply their respective services to all Company's Assets and is responsible for supervising all activities which may pose a risk to health, safety and environment to ensure they are completed in a safe manner without damage to the environment by:

- Ensuring all subordinates follow HSE procedures at all time;
- Act as the focal point of liaison between Asset HSE officers to ensure all operational requirements are met and carried out in accordance to the SMS;
- Ensuring the safety and welfare of field staff employees, contractors and all visitors to the Company's Assets;
- Meeting HSE targets and objectives, as specified by HSE Manager;
- Creation & implementation of field policies and procedures;
- Creation and development of safe working procedures;
- Assuming on-site responsibility in case of an emergency and initiate all required actions.
- Reporting all incidents, accident or spills immediately to Production Manager.

#### Senior Engineer

Senior Engineer's roles with regards to HSE include to:


- Integrate health, safety and environment in the design and specifications of construction and production sites by adopting and adhering to the relevant industry standards, as specified in the appendices of this document and environmental impact assessment (EIA) report;
- Approve the quality of design and engineering prior to construction and installation;
- Perform regular inspections during construction and installation to ensure approved designs are adhered to;
- Perform pre-start-up safety review and inspection of all equipment prior to commissioning;
- Administer preventative maintenance;
- Reporting all incidents, accident or spills immediately to both Team Leaders and Asset HSE Officer.

#### Senior Shift Supervisor

The Senior Shift Supervisor is responsible for supervising the field operators and contractors to ensure they are completed in a safe manner and adhered to the Company's HSE policy and procedures without damage to the environment by:

- Cascade the HSE policy and procedures down to subordinates and contractors to improve HSE awareness among staff and contractors;
- Ensuring all subordinates and contractors follow HSE procedures at all time;
- Supervising all subordinates and contractors in meeting HSE targets as specified by HSE Manager;
- Ensuring all possible precautions are taken to prevent incidents from happening or escalating and scheduling activities in such a way that no conflicting or potentially hazardous situations arise;

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- In coordination with the Asset HSE Officer, performing frequent site checks on processes, equipment, plant working conditions and safety standards.
- Act as emergency team leaders;
- Reporting all incidents, accident or spills immediately to both Team Leaders and Asset HSE Officer.

#### Shift Supervisor

The Shift Supervisor is the delegated person to check and control the on-site Permits to Work system and ensure that safe job executions. He reports to the Senior Production Shift Supervisor and shares the same HSE responsibilities.

#### Shift Foreman

The Shift Foreman is a member of the emergency response team (ERT) / on scene commander in case of an emergency. His roles also include:

- Monitoring of chemical injection operations and performance. Ensuring relevant safety precautions are taken with regard to chemical handling, storage and disposal.
- Maintaining an awareness of HSE issues at all times and immediately reporting any unsafe or unhealthy acts or conditions to his supervisor, if it is not possible to take action himself.

#### Production Operators

Each Production Operator is responsible for the maintenance of their designated sites by:

- Maintaining cleanliness and housekeeping at all times;
- Reporting all incident/accident/spills immediately to his field foreman or shift supervisor.

#### Refinery Supervisor


The Refinery Supervisor acts as a company representative, supervising crude oil loading at the refinery. He is responsible for ensuring all activities are carried out safely and in an environmentally acceptable way and that the Company's HSE policy is cascaded down to contractors. He is also tasked with:

- Ensuring competent staff operates the facilities and develops skills where necessary. Acting as mentor and "on the job" trainer for staff under control. Assisting in developing staff competency level.
- Improving safety awareness among staff;
- Assuming on-site responsibility in case of an emergency and initiate all required actions.

#### Refinery Operator

- Follow up on crude oil loading & HSE procedures at the refinery and ensure HSE regulations are adhered to;
- Maintain an awareness of safety with the road tanker drivers and immediately report any unsafe act or conditions to his supervisor, if it is not possible to take action himself;
- Reporting all incident/accident/spills immediately to his supervisor.

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#### Crude Loading and Tanker Coordinator

- Report spills immediately to his supervisor;
- Maintain safety awareness with the tanker truck drivers and take action and immediately report any unsafe acts to his supervisor.
- Carry out & minute of HSE meetings for tanker trucks on a monthly basis

#### Asset HSE Officers

Asset HSE officers assist in managing the overall HSE assessment process and provide specialist HSE services including to:

- Perform regular onsite audit inspections all operational phases (site construction, drilling, testing and production) to monitor compliance and report results to the Production Team Leader;
- Arrangement and coordination of site inspection and audits and timely assessment of risks to HSE and implementation of measures identified prevent or reduce further occurrences;
- Participate and conduct HAZOP, root cause analysis (RCA) studies / corrective action plans and execute as required, ensuring all non-compliance issues are addressed and closed out;
- Perform regular inspections of contractor's equipment;
- Educate and train staff within the Assets, using toolbox talks etc;
- Investigation of all reported incidents;
- Conduct the dust control and road cleaning program;
- Support road show and community relation activities;
- Reporting and documentation of all HSE matters.
- Be a part of the emergency response team (ERT).


### 3.2.3 Field Support Team

#### Upcountry Administration & Community Manager

The Administration Manager assisted by the Upcountry Administration & Community Manager and Land Administration Manager are accountable for the site procurement and community relation. In coordination with the Land & Legal Officer and Land & Community Liaison Officer, their health and safety responsibilities include:

- Ensuring all subordinates follow HSE procedures at all time;
- Ensuring all emergency contact numbers of the emergency response team and local emergency services are updated and available to all staff;
- Coordinating with Asset HSE Officers to distribute health, safety and environment information to staff;
- Coordinating with Asset HSE Officers with regards to health, safety and environment in the office, staff accommodation and for the Company's vehicles;
- Coordinating with Asset HSE Officers for PPE equipment;
- Providing specific health and safety training to personnel so that they are competent and capable of carrying out their work to the required standard and as required by regulations;
- Provision and supervision of all security issues;

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- Reporting all incidents, accident or spills immediately to Production Team Leader and Asset HSE Officers.
- Conducting the road show activity for the villagers in the areas of sensitive receptors;
- Recording all complaints in the log sheet and coordinating with relevant parties for clarification and reducing any conflicts between the company and nearby communities.

#### All Employees

All employees are encouraged to actively engage and participate with line management and supervisors in the implementation of and compliance to the requirements of the HSE Management System.

### 3.3 Employee Recruitment, Selection and Induction

#### Recruitment and Selection

The Company has procedures in place to ensure that all approved vacancies are filled by individuals with the appropriate qualifications and experience to fulfill the requirements of the position. All recruitment and selection is undertaken in accordance with the relevant legislation.

The management goals for recruitment and selection are to:

- conduct recruitment and selection in line with good practice and legislation;
- identify the best candidate for the position using job description, competence profile, and structured interview.

#### Induction

The company recognizes that communication and dissemination of information, rules and regulations is essential for any new employee. This is a staged process, as follows:

- initial induction with personnel which includes HSE awareness, fire, first aid and evacuation procedures as well as day-to-day personnel issues; This will be oriented by Asset HSE Officer.
- departmental induction by line management which includes pre-job discussions.


The management goals for induction are to:

- provide sufficient information specific to the job so that the individual is competent to perform the work in a safe and efficient manner;
- provide every new employee with general information on the Company;
- provide every employee with all necessary health and safety information including a general awareness of the Safety Management System.

#### Management performance standards for recruitment and selection:

- objective evidence that recruitment and selection processes and procedures have been successful;
- record of the induction, endorsed by the employee;
- personnel are fully aware of the information provided during inductions.

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#### Management responsibility for meeting performance standards:

- General Manager/ Managers

### 3.4 Employee Training and Development

The company recognizes the importance of the training and development of its entire staff in order to maintain and improve standards of performance and to maximize individual employee development.

#### Management goals for training and development:

- to train and develop employees, as necessary, against the requirements identified by performance appraisal and competence assessment and maximize their contribution to the Company;
- to ensure that employees maintain up-to-date knowledge of their specialist discipline and are aware of technological changes/advancements in their particular area.

#### Specific Health Safety and Environmental Training

Specific HSE training is conducted as necessary and is specifically targeted to the requirements of the employee and his job. Specific HSE training includes, but is not limited to:

- specialized fire and first-aid training;
- health, safety and environmental legislative training;
- training in the specific elements of the Safety Management System
- Instructors of training courses will be both recognized private organization and government officers.
- Training requirement for concerned will be provided per HSE-PM-013.

#### Management performance standards for HSE training:

- identification of competence development requirements for all employees and the relevant training to address these requirements;
- evidence that training and development has been completed by individuals;
- maintenance of records for training & development.


#### Management responsibility for HSE Training:

- The Asset HSE Officers are responsible for finding the interesting courses together with the effective trainers to provide the training for all personnel in the oilfield to keep filling the gap of improvements on safety awareness.

### 3.5 Employee Performance Appraisal

The Company has a formal performance appraisal process which is conducted on an annual basis. The immediate supervisor reviews the past performance of the employee against previously set objectives and determines the objectives for the forthcoming year. Individual career development and direction is discussed, as is training and development needs. From this, an individual training and development plan is developed, which is also linked to any competence development needs identified during the performance appraisal review.

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#### Management goals for performance appraisal:

- to give a constructive overview of achievement over past year;
- to evaluate effectiveness of the individual's performance against their set objectives;
- to review training undertaken over past year and its effectiveness;
- to identify future training and development needs;
- to set objectives for the forthcoming year;
- to discuss individual's future career development and aspirations;
- to record performance and outcome of performance appraisal.

#### Management performance standard for performance appraisal:

- completion of annual performance assessments for all employees.

#### Management responsibility for performance appraisal:

- General Manager /Managers

### 3.6 Employee Competence Assurance

The effective management of health, safety and environmental risk relies on the competence of all the personnel engaged in operations. Competence is defined by an employee or a contractor having suitable skills, experience and training in order for them to carry out their responsibilities safely and effectively. This requires not only professional, technical and personal skills but also the necessary HS&E awareness to ensure that the role is carried out without endangering the individual, others, property or the environment.


Competence assurance is an ongoing process and begins prior to recruitment and selection and continues throughout an individual's employment with the Company. It comprises of a number of elements:

- the individual's job description which defines the activities to be carried out;
- the individual's competence profile, i.e. competence levels required to conduct those activities and responsibilities against the performance standards required by the Company;
- the individual's competence assessment, i.e. validation of skills, on-the-job assessment, performance appraisal, signed off by the line manager;
- the development and maintenance of an individual's competence, i.e. training, re-validation, updating.

#### Management goals for competency for employees and contractors

- the clear understanding by all employees of the work to be carried out using their job descriptions, which include accountability to others, responsibility to others, main tasks, HSE responsibilities, qualifications and experience, and personal attributes;
- developing levels of competence against each task and responsibility within the job description;
- conducting competence assessment on a regular basis, using on-the-job assessment, satisfactory completion of training, performance appraisal;
- ensuring that each employee is involved throughout the competence assurance process and understands and resolves any areas of competence shortfall;
- developing an individual training and development plan linked to competence development

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needs, including on-the-job training, professional training schemes, training using the procedures and equipment supplier training;

- maintaining the required competence level by re-validation, updating skills to take account of advancing technologies, refresher training and exercises/drills, as appropriate;
- maintaining a record of the competence assurance process for each individual and documenting all findings.

#### Management performance standards for competence:

- implementation of job descriptions and required competence levels;
- documentation confirming competence level achievement;
- documentation up to date and signed off by line management.

#### Management responsibility for competency for employees:

- General Manager / Managers

For The Company's employees, the respective line manager is accountable for their development and training to ensure that they are competent before assigning them responsibilities.

### 3.7 Management of Contractors

The Company utilizes specialist contractors and materials suppliers to carry out certain operations and for the supply of equipment. The processes of hiring and managing contractors to ensure that The Company's HSE policy is complied with will depend on the tasks to be performed and the hazards posed. Safety critical tasks and equipment will be targeted as being crucial for management to address. The Company's contract procedures will be followed for contract placement.

The relevant manager responsible for hiring the contractor will assess whether the tasks, or equipment, being tendered for, are safety critical. If they are assessed as such, then the tender document will insist on the following management goals being achieved:


#### The management goals for contractor management are to:

- assess whether the contractor has a Health Safety and Environment Management System that complies with The Management of HSE Regulations and is capable of being interfaced with The Company's SMS;
- assess the contractor's HSE Management System for standards that are commensurate with the level of risk to be imported;
- assess the level of contractor compliance with their own procedures;
- assess the commitment of the contractor management to The Company HSE's requirements;
- approve / qualify contractors meeting the required standards;
- determine the on-going performance of the contractor;
- provide a database of information on contracting companies for future use.

### 3.8 Procurement of Equipment and Services from Contractors and Suppliers

As part of the SMS policy and procedures on procurement, The Company only purchases approved equipment from qualified suppliers. The requisitioning manager is responsible for the relevant technical specifications and information, safety and quality assurance requirements, delivery programme and vendor pre-qualification.

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#### The management goals for the procurement of equipment and materials are to:

- ensure that The Company safety procedures Contractor Safety (HSE-PM-014) are complied with throughout the procurement process;
- purchase only approved equipment from qualified suppliers against specification and performance standards.

#### Management performance standards for the management of contractors and procurement of equipment:

- standards and procedures for selecting and monitoring contractors are in place and that they are being utilized effectively;
- effective and suitable arrangements are used for controlling purchasing of equipment and materials.

#### Management responsibility for the management of contractors and procurement of equipment:

- General Manager/ Procurement Manager

### 3.9 Workforce Involvement and Communication

(See Section 4.3 for detail on managing HSE communication.)

#### Involvement in Procedures and Work Instructions

Involving the workforce in the development of procedures and work instructions is crucial to their relevance and utilization. Wherever possible, line managers, including supervisors will consult with their colleagues and the HSE Manager, during the preparation of procedures and work instructions.

#### Involvement in Incident Reporting and Investigation

In line with the Company policy and objectives, employees at all levels may be required to be involved in the investigation of incidents per Accident investigation report procedure (HSE-PM-002). The level of involvement is defined in the investigation procedure but in all cases maximum use will be made of specialist employee knowledge when identifying direct and indirect causes of incidents and determining the actions to prevent recurrence.

#### Involvement in Management Safety Meetings

See section 4.3 for The Company policy and performance standards for safety meetings.


#### Involvement in Pre-Job Discussions

The objective of these meetings is to ensure that all members of a work team understand the hazards, controls (PTW etc.) procedures, work instructions, are familiar with the work environment, have the correct tools and equipment and are competent to carry out the work.

#### Involvement in SMS Inspections and Audits

The inspections and audits required by the SMS (see Section 5) require the participation of the workforce to demonstrate their understanding of the system. The quality of audit reports relies on accurate feedback from the workforce. It should be recognized as a positive exercise, as the results of these audits provide the basis for performance improvement.

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### 3.10 Document Control, Review and Update

#### Maintenance of SMS Documentation

In order to ensure that the content of the SMS is maintained current with regard to legislation, industry standards and company requirements, the SMS documentation is controlled. The Company SMS document structure is shown in Appendix 2 and the master SMS document listing is contained in Appendix 3. The custodian for the SMS overall is, on behalf of the Chief Executive Officer, the General Manager, HSE Manager.


#### Management Goals

- SMS documentation is maintained in accordance with HSE document control procedures;
- revisions are originated, reviewed and approved at the appropriate level;
- documentation is issued in a controlled manner;
- the SMS documentation complies with current legislation.

#### Review and Update

- Requests to amend the SMS should be addressed to HSE Manager and will be approved by the Chief Executive Officer and/or General Manager during the annual review of the SMS.

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- manage well performance;
- manage tanker operations;
- plan and execute inspection and maintenance;
- procure and control materials, equipment and services;
- modify facilities;
- provide health, welfare and emergency services;
- environmental and waste management;
- manage office and warehouse facilities;
- abandonment and decommissioning.

#### Managing Production Well Intervention Operations

- well programme design, planning and execution.

Within each of these business processes there are numerous activities that generate hazard potential and the requirement to manage the risks. These are managed by the introduction of written controls, either generic standards or project-specific procedures. All of the controls are controlled documents under the SMS (see Appendix 3 for the master listing). The general principles of the risk management process are described in Section 4.2.

### 4.2 Hazard and Risk Management

The Company requires that risk assessments be undertaken to ensure that it complies with any relevant statutory provisions and thereby reduce the risks so far as reasonably practicable.

#### The Risk Management Process

Risk management consists of the following activities:

#### Hazard Identification, Risk Assessment, Control and Mitigation

##### Identifying the Hazards

A hazard is defined as something with the potential to cause harm. The techniques used to identify hazards depend on the nature and complexity of the operation or activity. They could range from observation and recording to the use of specialist techniques such as HAZOP/HAZID.

##### Assessing the Risk

- Risk is defined as the likelihood that the harm from a particular hazard may occur. The level of risk is dependent on the frequency of exposure to the hazard, the potential severity and the probability that the hazard will be realised.


##### Managing Risk

Eliminating the risk is the preferred option. If risk cannot be eliminated, then reducing the risk to an acceptable level will be achieved through the identification and implementation of control measures.

##### Mitigation Measures

In the event of failure to manage risk then contingency plans are developed to minimize loss.

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### Section 4: Planning and Implementation

Planning and implementation of the Safety Management System is integrated into the management of the normal business activities of the Company. The listing of the main risk generating activities, typical of any upstream oil operating company, are summarized below. These activities will be managed by utilizing the controls and standards referred to in the Business Processes Listings contained in Appendix 1. The controls and standards listed there represent the Company's corporate policy for managing the activities and thereby for reducing the risks to as low as reasonably practicable.

A number of specific management activities that relate to health, safety and environmental issues are included below the business processes in this section.

#### 4.1 ECO Orient Energy Business Processes

##### Managing Seismic Operations

The following summarizes the activities that would be undertaken by the Company in connection with seismic operations:

- prepare for seismic operations;
- execute seismic operations.

##### Managing Exploration, Appraisal and Development Well Operations

The following summarizes the activities that are undertaken by the Company in connection with exploration and appraisal drilling operations:

- well design and planning;
- prepare drilling facilities and worksite;
- well construction and handover (or abandonment);
- management of well equipment and materials;
- selection and management of contractors;
- logistics management;
- environmental and waste management;

##### Managing Facilities Design and Installation

The following summarizes the activities that are undertaken by the Company in connection with the development of existing or new field(s):


- prepare field development plan and a basis for design;
- prepare a field development specification and implementation plan;
- preparation of detailed design;
- procure and control material, equipment and services;
- construct and commission facilities.

##### Managing Production Operations

The following summarizes the activities that are undertaken by The Company in connection with production operations:

- plan and execute field activities;

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#### The management goals for risk management are:

- to carry out hazard identification and risk assessments at work sites; by area supervisors/manager with advising from HS department.
- to ensure hazard identification and risk assessment is carried out by personnel with appropriate training and experience;
- to establish acceptable levels of risk;
- to prioritize the identified hazards by the risks presented;
- to develop achievable action plans for the reduction of risk;
- to measure progress against the action plans;
- to review the assessments when conditions significantly change;
- to develop contingency plans to deal with emergency events.

#### The management performance standards for risk management:

- completion of hazard identification, risk assessment and development of controls for business processes and specific projects/assets;
- evidence of an effective approach to and implementation of controls;
- evidence of hazard identification and risk assessment in the design of new facilities or equipment;
- effective contingency plans.

#### Management responsibility for risk management:

- General Manager/ Production Assets Managers/ HSE Manager

#### 4.3 HSE Communication

Efficient communication, both up and down the organization, is essential for the SMS and other management systems to function effectively. The communication structure is designed not only for the passage of information but to motivate people through their involvement and understanding. It is recognized that well motivated employees will contribute more towards the overall success of the Company.

##### 4.3.1 Safety Consultation

#### The management goals for safety consultation are:

- to arrange a consultation;
- to provide the information required under regulations.

#### The performance standards for safety meetings are:


- HSE Committee meeting procedure HSE-PM-015 in place and functioning effectively;
- information required under regulations is provided to the workforce.

##### 4.3.2 Management Safety Meetings

Safety meetings are essential for assessing HSE performance, for involving the workforce and as a means of expressing management commitment to the safety culture. The following formal meetings will be held. The purposes of the meetings are to review health, safety and environmental performance and to seek improvements.

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#### Site Management Safety Meetings

The site management meetings will be held monthly at Wichian Buri, and will follow a structured process chaired by the chairman of HSE Committee. The meetings will be minuted and the actions arising will be recorded, with responsibilities for the actions identified. The secretary of HSE Committee will collate the actions and assigned responsibilities register.

#### Corporate Safety Meetings

Corporate safety management meetings will be held annually and will be chaired by the **General Manager**. The meeting minutes will be taken and the actions arising will be recorded with responsibilities for the actions identified. The HSE Manager will collate the actions and assigned responsibilities on an action register.

#### The management goals for safety meetings are:

- to review safety performance and assess results;
- to produce and maintain an SMS improvement plan;
- to provide the necessary resources to implement the improvement plan;
- to maintain effective communication with all employees and contractor staff.

#### The performance standards for safety meetings are:

- agenda produced and circulated prior to each meeting;
- minutes produced and circulated within 5 working days;
- action list produced by HSE Manager and updated before next meeting.

#### Management responsibility for safety meeting:

- General Managers/ HSE Manager/Production Manager/ Drilling Manager/Relevant Managers

#### 4.3.3 Worksite Pre-Job Discussions

Effective communication on the worksite involving the entire workforce is a major component of incident prevention. Pre-job discussions should address the work to be undertaken, the identified hazards, precautions and controls. Significant topics or identified problem areas may be the subjects of further discussion especially if there is an impact on company standards or procedures.


#### The management goals for worksite discussion are:

- to ensure a satisfactory level of understanding of the work to be undertaken;
- to ensure that all hazards have been identified and that adequate controls and follow up are in place;
- to ensure that PPE and the equipment are fit for purpose for the work;
- to ensure that the permit to work system is being complied with;
- to ensure that the Emergency duty roster are updated.

#### The performance standards for work site discussions:

- full understanding of the work to be undertaken;
- all hazards have been identified and that adequate controls and follow up are in place;
- PPE and the equipment are fit for purpose for the work;

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- the permit to work system is being complied with;
- Emergency duty roster are updated.

#### Management responsibility for worksite discussion:

- General Manager/ HSE Manager / Area Managers / Team Leaders / Senior Engineers

#### 4.3.4 Hazard Reporting by the Workforce

Any hazard perceived by any employee can be raised to the area supervisor/ Manager and HSE Manager. This system provides the workforce with an effective mechanism for communicating to management any hazards or occurrences that are perceived. The HSE Manager will ensure that matters are addressed by the appropriate manager. Valid feedback will always be given to the originator.

#### The management goals for hazard reporting are:

- to provide a credible hazard reporting and communication system;
- to ensure a rapid response to all hazard information.

#### Responsibility for hazard reporting: All Employees

#### Responsibility for hazard report collation and dissemination: HSE Manager

#### 4.3.5 Safety Alerts and Safety Information

The company communicates important HSE information through the issue of Safety Alerts and by maintaining an up to date library with relevant safety information at its main sites. Safety Alerts are issued by the Asset HSE Officer from information supplied by personnel from any of The Company's locations or from government or trade associations. If applicable, the information may be incorporated into processes, procedures or working instructions, safety board.

#### The management goals for safety alerts and safety information are:


- to communicate critical health and safety information to all relevant personnel and locations;
- to amend company processes and procedures based on the alerts;
- to make available up to date health, safety and environmental information.

#### Management performance standard for safety alerts

- the timely issue and distribution of safety alerts;
- the timely update of safety and environmental information.

#### Management responsibility for Safety alerts and Safety Information: HSE Manager

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#### 4.4 Occupational Health Standards

##### 4.4.1 Employee Occupational Health Standards

All employees are subject to health surveillance by the Company. The process begins at the employment stage and periodic examinations are carried out at appropriate intervals.

Program of Health Checkup per HSE-PM-005

- Pre-employment Health Checkup
- Annual Health Check up
- Comply by local laws

#### The management goals for health surveillance are to:

- comply with company and legislative standards;
- maintain a programme of periodic medical examinations;
- ensure professional medical attention is available to all company location.
- maintain First Aid Station with qualify personal and medicine by laws

#### The management performance standards for health surveillance are:

- employees health is monitored and appropriate assistance provided throughout their employment;
- appropriate medical records and results of health monitoring are maintained.

#### Management responsibility for Occupational Health standards:

- HSE Managers

##### 4.4.2 Substance Abuse

The potential of substance abuse is recognized by the Company. Management will place the emphasis on initially identifying that a problem exists and then working with the employee to resolve the problem. Continued abuse in the workplace however, will be handled under the disciplinary procedure.

#### The management goals for substance abuse are to:

- actively discourage substance abuse in the workplace;
- proactively identify potential abuse and provide counseling.

#### The management performance standards for substance abuse are:

- the elimination of substance abuse at the workplace.

#### Management responsibility for substance abuse:


- Production Assets Manager/ HSE Manager/ Up-country Admin Manager

##### 4.4.3 Control of Substances Hazardous to Health

The company is committed to eliminating, or controlling, the risks arising from the use of any substance that presents a health risk to employees. To do this all such substances in use will be identified and the risks arising will be evaluated. Controls will then be put in place to reduce that risk to an acceptable level.

Although The Company provides suitable personal protective equipment per Personal Protective Equipment HSE-PM-004 for use by employees this is not considered to be the primary control

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measure. Elimination or substitution with a less harmful substance is the preferred management option.

The Production Assets Manager, or project manager, is responsible for implementing all the necessary precautions and controls and for ensuring that the product has been assessed and any hazards/risks evaluated.

#### The management goals are:

- to carry out assessments at all company sites;
- to produce data sheets for all the identified substances;
- to implement controls to reduce the risk to an acceptable level (in order of preference), by:
  - substitution of safer products;
  - personal protective equipment;
  - instructions and pre job briefings prior to use of hazardous substances;
  - hazard identification, risk assessment and implementation of control measures;
- to monitor the effectiveness of the control procedures;
- to provide health hazard, risk and control measures information to employees.

#### Management performance standards

- assessments carried out at all company sites;
- data sheets available for all the identified substances;
- controls are implemented to reduce the risk to an acceptable level;
- employees are aware of the health hazard, risk and control measures.

#### Management responsibility for Control of Substances Hazardous to Health:

- Production Manager

#### 4.5 Standards and Procedures

Clear, concise, well understood procedures, guidelines and controls are essential to reduce injury to people, damage to plant and equipment and the environment.

For standards and procedures to be effective they must follow a standard format, be developed and updated by the personnel who will eventually use them. They must always be easily accessible and up to date.


The Company's management standards and procedures are covered in section 4.1. Document management is covered by Section 3.10

#### 4.6 Equipment Examination

The Company will ensure that examination of certain equipment and operations is carried out by competent persons, as required. The examinations can be carried out by competent persons employed by the Company or by a nominated contractor. The well examiner must be independent of the line management. A separate written scheme for these examinations will be in place for each site and will comply with the relevant regulatory guidance.

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#### The management goals for examination are to:

- set up an examination scheme for the equipment or operation;
- ensure that all the appropriate equipment is identified and subject to examination;
- maintain records of examination;
- ensure any reported defects are acted upon.

#### Management performance standards for examination

- examination schemes in place;
- all the equipment has been identified and is subject to examination;
- records of examination are maintained;
- all defects have been acted upon.

#### Management responsibility for Equipment Examination:

- Asset Leader/ Production Assets Manager

#### 4.7 Maintenance System

The Company will ensure that all equipment which presents a risk to employees, other facilities or to the environment is in a safe and efficient condition. The company operates a maintenance system that identifies the level of maintenance that is required, including the frequency and maintains records of all maintenance carried out.

#### The management maintenance goals are to:

- identify which equipment is subject to planned maintenance;
- provide defined maintenance routines for the equipment;
- maintain such equipment in a safe and efficient condition;
- maintain records of all maintenance carried out.

#### Maintenance management performance standards

- all safety critical equipment in a safe and efficient condition;
- up to date records of all equipment requiring maintenance are maintained;
- up to date maintenance routines, including frequencies are available;
- up to date maintenance records are available.

#### Management responsibility for Maintenance Systems:

- • Production Assets Manager /Asset Leader


#### 4.8 Permit To Work System

The Company's Permit to Work system must be utilized for risk operations. It provides for a written instruction from the person in charge of the area to the person carrying out the work. The permit to work records where, when and how the work is to be executed, identifies hazards, any additional precautions and the control measures and requires that the site and plant/equipment status be recorded on close out of the work.

#### The management goals for the permit to work system are to:

- provide a level of control for high risk operations;

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- ensure all personnel who may be affected by the work are aware and involved;
- monitor compliance with the permit to work system through audit.
- Comply with Work Permit Procedure (HSE-PM-003).

#### 4.9 Managing Working Time

All the Company's sites will ensure that the requirements of the Working Time Regulations are complied with by ensuring that staff does not work excessive hours without their agreement.

#### The management goals for managing working time are to:

- To comply with the Working Time Regulations.

#### Performance standards for working time management

- Regulatory compliance achieved.

#### 4.10 Managing First Aid

All company locations will have suitable first aid equipment and facilities available in compliance with the First Aid at Work Regulations.

#### The management first aid goals are to:

- identify and provide sufficient, trained, first-aiders; by comply per HSE Training requirement procedure HSE-PM-013 as a minimum.
- identify the appropriate first aid equipment and facilities required;
- provide the equipment and facilities;
- maintain first aid equipment and facilities in a safe and efficient condition.

#### First aid provision performance standards

- sufficient, trained, first-aiders provided;
- appropriate first aid equipment and facilities provided;
- equipment and facilities provided;
- first aid equipment and facilities maintained in a safe and efficient condition.

#### Management responsibility for Managing First Aid:

- HSE Manager


#### 4.11 Managing Incident Reporting and Investigation

Incident reporting and investigation positively contribute to the process of accident prevention. The Company's management will be involved in the process of investigation, dependent upon the severity or potential severity of the incident, in order to identify the underlying causes and to implement actions to prevent recurrence.

#### Reporting and Investigation Procedure

Employees are required to report all accidents and incidents in which they are involved to their line manager/ supervisor. These include injury to personnel, damage to plant and equipment, harm to the

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environment and near misses. Accurate and timely reporting is essential to ensure effective follow-up.

Following the initial report, the formal company incident reporting and investigation procedures HSE-PM-002 are followed.

Significant accidents and incidents are reviewed at the Management Safety Meetings.

#### The management goals for accident reporting and investigation are to:

- to encourage the reporting of all accidents, incidents and near misses;
- to investigate all reported accidents and incidents at a level commensurate with their potential;
- to develop realistic, achievable recommendations to prevent recurrence;
- to communicate the findings of investigations to all interested parties to prevent recurrence;
- to provide a database of information for performance measurement.

#### The management performance standards for accident reporting and investigation are:

- the timely provision of data on incident occurrence and incident reports;
- the full completion of investigations, determining root causes;
- high quality investigation report;
- follow up recommendations prevent any recurrence.

#### Management responsibility for accident reporting and investigation:

- Area Managers/ HSE Manager

#### 4.12 Contingency Planning and Emergency Response

The Company recognizes that even with the implementation of an effective management system there is always the potential for incidents to occur. At all sites, management will identify high-risk scenarios, develop emergency response plans and train employees to provide an effective response should it be required. Emergency procedures HSE-PM-001 and contingency plans will be regularly updated and exercises carried out in order to maximize their effectiveness.

Separate emergency plans will be prepared for major operations, such as well operations, that involve a significant change to normal site operations.

A corporate emergency response procedure will also be in place to ensure that emergency communications can be established with senior management.


#### The management emergency response goals are to:

- identify potential emergency scenarios associated with all company's operations;
- provide easily understood procedures to be followed by personnel at all sites;
- ensure sufficient trained personnel and resources are available to support the control of an incident.

#### Emergency Response Training

Emergency response information is provided to employees during induction. Specific training per HSE-PM-013 HSE Training Requirement will be given relating to the site where an employee is likely

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to work and emergency response training given when new plans are issued or if plans are amended.

#### The emergency response training management goals are to:

- provide a competent response to emergencies;
- to evaluate the effectiveness of response to an emergency.

#### Emergency response management performance standards:

- availability of clear and concise contingency plans and emergency procedures at all sites;
- sufficient training carried out for identified personnel;
- exercises are planned and carried out regularly;
- documented debriefing and feedback leads to improvements in plans and procedures.

#### Management responsibility for Emergency Response Plan:

- General Manager/ Production Asset Manager/ HSE Manager

#### 4.13 Managing Engineering Design and Construction Change

A design review process will be in place at all company sites which will ensure compliance with all regulatory requirements, codes and standards. Design reviews, held during the various stages of a project, may generate changes to the original design; these are managed using the plant modification procedures.

#### The management goals for design change control are:

- to ensure all potential hazards connected with a project or design change have been identified;
- to control changes and obtain the necessary approvals before the change is implemented;
- to check the design and consider whether any of the conditions which may occur from either a malfunction or operation, have the potential to cause a hazard to people working on the location or to the installation/equipment;
- to check the precautions incorporated in the design are sufficient;
- to ensure the safety engineering of the design meets the requirements of legislation and any inspection scheme;
- to ensure that the original design has not been compromised by changes at design stage;
- to ensure any operating manual addresses all the safety aspects required by changes.


#### Performance Standards:

- roles, responsibilities and reporting lines are clearly identified for managing changes;
- design reviews identify the hazards and changes required to mitigate risk;
- design changes are undertaken in accord with the plant modification procedure.

#### Management Responsibility for Managing Engineering Design and Construction Change

- General Manager/ Production Assets Manager/ Asset Leaders

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## Section 5: Performance Measurement

Measurement is essential for improving health safety and environment performance. Measurement of performance is achieved by pro-active and reactive monitoring to provide information for feedback and correction.

### 5.1 Active Safety Monitoring

#### Planned Inspections

Planned inspections will be carried out at each site in accordance with a pre-arranged schedule and an inspection checklist. These will be carried out by the line manager responsible for the site. The condition of plant and equipment is measured against pre-determined standards. In this way sequential inspections become comparable and the results can be utilized as a performance indicator. Non-compliance with standards generates nonconformance reports, which are prioritized for action.

#### The management goals for planned inspections are:

- to establish the condition standards for plant and equipment;
- to measure the level of compliance to the standards;
- to involve employees in the development of standards and in measuring compliance;
- to record and collate inspection records;
- to provide a valid indicator in respect of safety management performance.
- to comply on facility Safety Inspection Procedure (HSE-PM-008).

#### Safety Meetings Follow Up

Safety meetings and pre-job discussions provide a performance indication of the effectiveness of the SMS.

#### The management goals for active monitoring are:

- to measure the level of compliance to standards;
- to record and analyze the outputs from monitoring;
- to ensure that follow-up action is taken.


### 5.2 Reactive Monitoring

#### Statistical Reports

The HSE Manager and Area Manager record and analyses the statistics on all accidents, damage to plant and equipment, harm to the environment and near misses. Following each accident or incident report the causes of incidents are reviewed to provide an incident as to where increased emphasis or effort needs to be placed.

Incidents are assessed by the HSE Manager and Area Manager for their potential severity to identify the level of risk associated with the incident potential.

Incident frequency rate statistics are compiled using conventional frequency rate calculations.

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## The management goals for reactive monitoring are:


- to provide company performance indicators for safety management against incident and potential incident occurrence;
- to identify the root causes of accidents and incidents;
- to identify areas where resources should be directed to prevent recurrence;
- to identify procedural deficiencies that can be addressed to prevent recurrence.

## Management performance standards for active and reactive monitoring:

- confirmation that the programme of inspections is being met and reports issued;
- confirmation that the schedule of safety meetings is being met;
- quality of safety meeting minutes and defined actions;
- compilation of on-going incident statistics and identification of trends;
- issue of annual report on monitoring;
- completion of corrective actions following inspection, audit and incident investigation.

## Management responsibility for active and reactive monitoring:

- Area Managers/ HSE Manager.

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## Section 6: Reviewing Health and Safety Performance

Review and audit of the SMS provides the feedback loop as identified on the management model in Section 1.3.

### 6.1 Management Performance Review


The overall company health and safety performance is reviewed by collecting evidence from various sources:

- results of audits
- assessment of active and reactive monitoring activities
- feedback from employees
- new legislation.

The evidence is used to feedback into the SMS any changes required to improve performance.

#### The goals for management review are to:

- review all HS performance indicators and other relevant information;
- identify areas requiring additional resource or redirection of emphasis;
- review Company HSE objectives and amend these as necessary.

	Document / Rev No:	ECO-HSE-001-Rev 0
Health Safety and Environment	Revision Date:	25 July 2013
MANAGEMENT SYSTEM		

## Section 7: SMS Audits

Auditing is a structured process of collecting independent information on the efficiency, effectiveness and reliability of the total HSE management system and drawing up plans for corrective action. Auditing is not a substitution for the other essential parts of the SMS.

#### Auditing seeks to establish:

- that the appropriate management arrangements are in place;
- adequate risk control systems exist and are implemented;
- appropriate workplace precautions are in place.

#### Authority and Responsibility

The HSE Manager and relevant Managers are responsible for the development of audit program with advising by General Manager.

#### Audit Frequency

The scope and frequency of internal (and external) audits will be determined according to specific needs and risk rated priorities.

#### The management goals for auditing the SMS are to:

- determine and report the level of compliance to the SMS standards and procedures;
- determine the level of understanding by employees of the contents of the SMS;
- provide the performance indicators as to achievement in the implementation of the SMS which will contribute towards the improvement process;
- recommend the remedial action(s) where necessary.

### 7.1 SMS Improvement Plans

SMS improvement plans are generated during HSE management review meetings. These provide the detailed actions to be implemented to improve The Company's HSE performance. The implementation of the plans is the responsibility of the **General Manager** who reports to the Board of Directors. They are monitored on his behalf by the HSE Manager.

#### The management goals for improvement plans are to:

- provide an action plan for the improvement of the SMS;
  - what is to be achieved
  - who will do it
  - when will it be completed by
- provide a single reference point for the improvement of the SMS.

#### The management performance standards for improvement plans are:

- development of an SMS audit plan;
- completion of the annual SMS audit plan,;
- completion of the SMS management review;
- generation of management improvement plans with clear objectives, tasks and timescales.

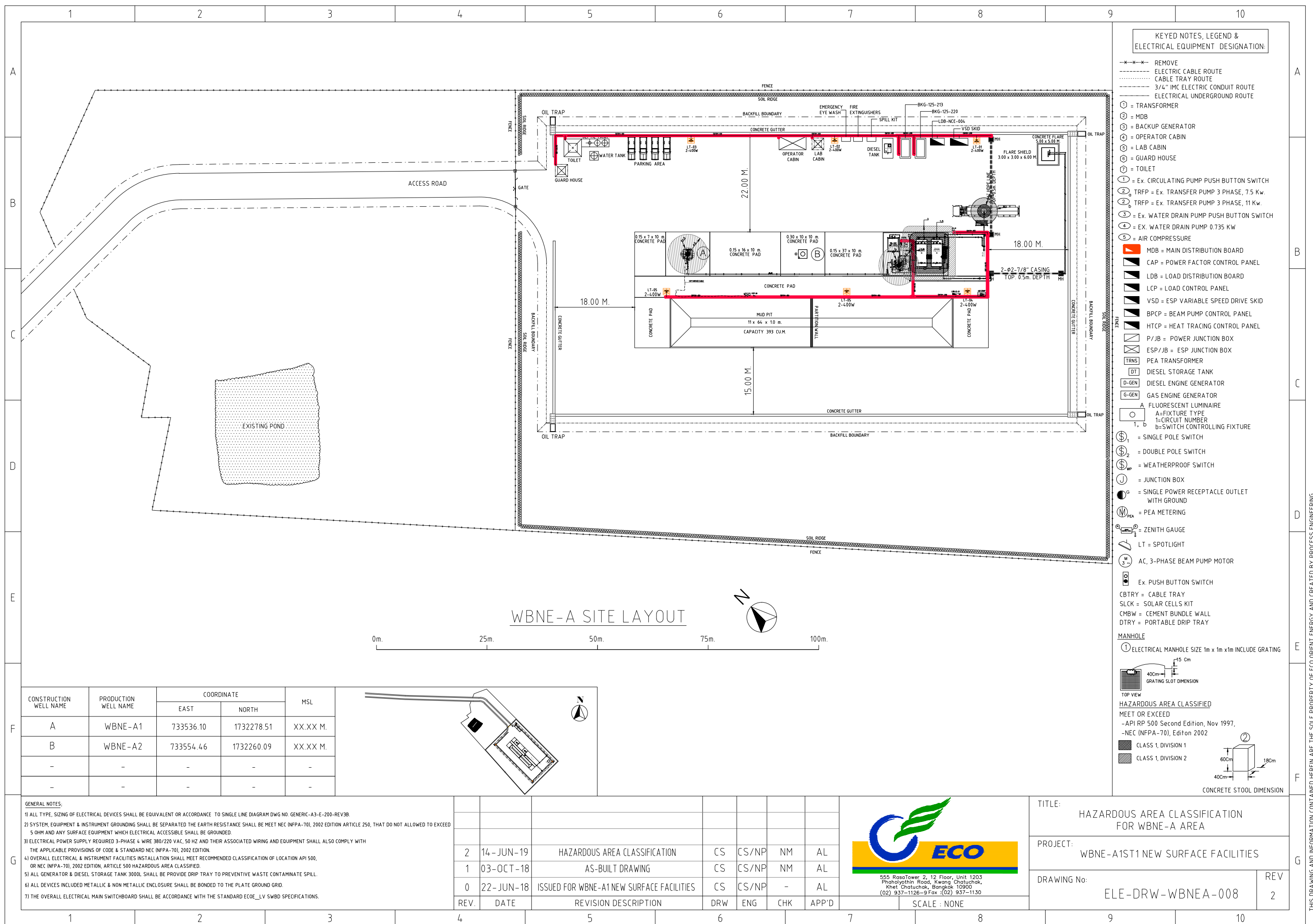


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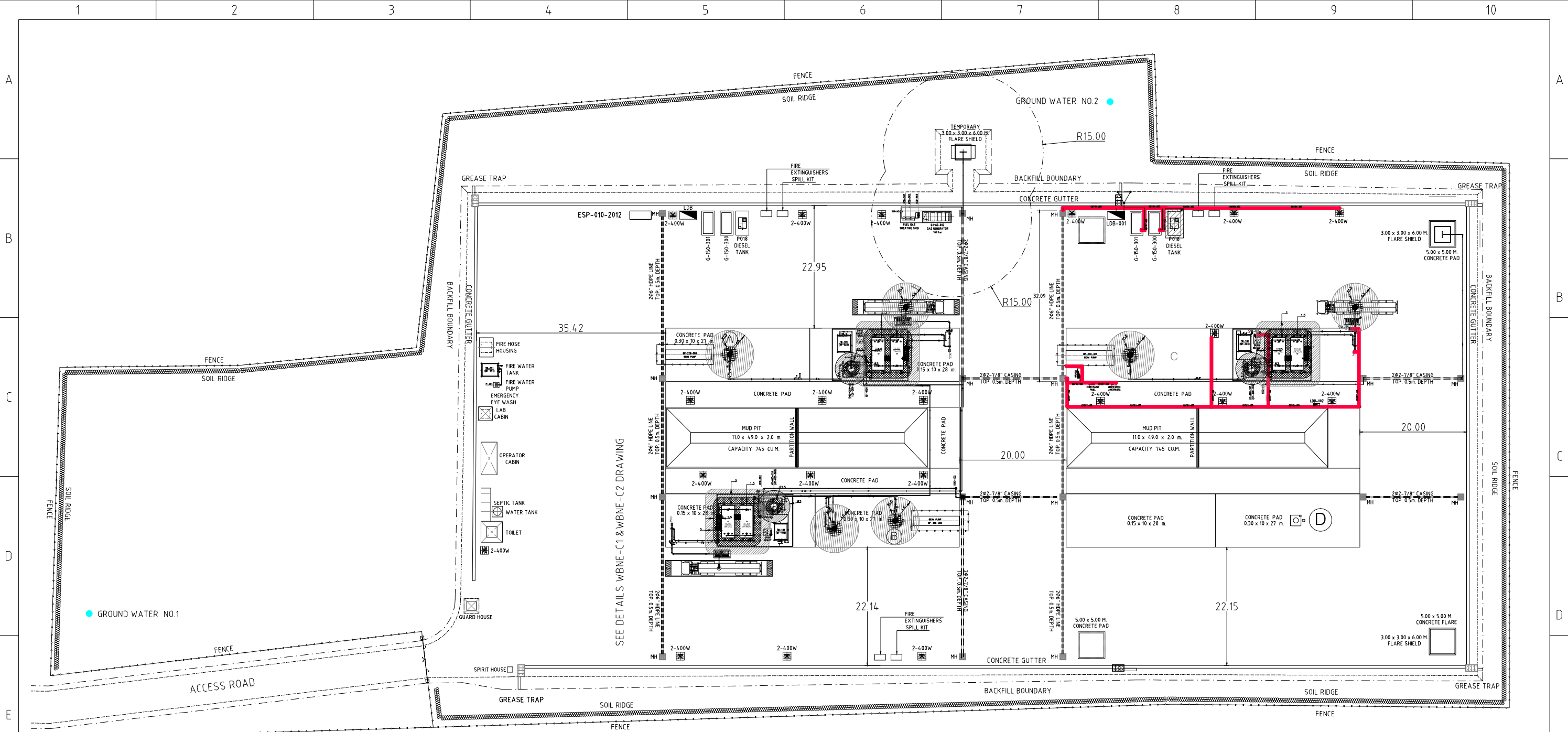
## Hazardous Area Classifications

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CONSTRUCTION WELL NAME	PRODUCTION WELL NAME	COORDINATE		MSL
		EAST	NORTH	
A	WBNE-C1	734524.31	1731182.65	83.50 M.
B	WBNE-C2	734494.83	1731149.34	83.50 M.
C	WBNE-C3	734524.31	1731107.65	83.50 M.
D	WBNE-C4	XXXXXX.XX	XXXXXXXX.XX	XX.XX M.



HAZARDOUS AREA CLASSIFIED  
MEET OR EXCEED  
-API RP 500 Second Edition, Nov 1997,  
-NEC (NFPA-70), Edition 2002

CLASS 1, DIVISION 1  
 CLASS 1, DIVISION 2

SYMBOLS FOR DENOTING ZONE 0, ZONE 1, ZONE 2 HAZARDOUS (CLASSIFIED) AREA (API RP 505)

ZONE 0  
 ZONE 1  
 ZONE 2

1	14-JUN-19	UPDATED HAZARDOUS AREA CLASS.	CS.	CS/NP	NM.	AL.
0	5/02/19	ISSUED FOR CONSTRUCTION	NP.	CS/NP	NM.	AL.
REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP'D

555 RasaTower 2, 12 Floor, Unit 1203  
Phaholyothin Road, Kwang, Chatuchak,  
Khet Chatuchak, Bangkok 10900  
(02) 937-1126-9 Fax: (02) 937-1130

SCALE : NONE

TITLE:	HAZARDOUS AREA CLASSIFICATION FOR WBNE-C AREA
PROJECT:	WBNE-C SURFACE FACILITIES INSTALLATION
DRAWING No:	ELE-DRW-WBNEC-008
REV	1

ภาคผนวก จ-6

## Hazard and Operability Study (HAZOP Study)

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**ECO ORIENT ENERGY (THAILAND) LIMITED**  
**ECO ORIENT RESOURCES (THAILAND) LIMITED**

**ENGINEERING DOCUMENT**

**HAZARD AND OPERABILITY STUDY**  
**(HAZOP STUDY)**  
**(ED-ECOR-HES-14102-01)**

**Original By** Name :   
Position : Engineering Team Lead  
Signature : ..... Date : 09-Oct-2014

**Approved By** Name :   
Position : Engineering Team Lead  
Signature : ..... Date : 09-Oct-2014

**Endorsed By** Name :   
Position : Production Manager  
Signature : ..... Date : 09-Oct-2014

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PERSON RESPONSIBLE  
SR PROCESS ENGINEER

ED-ECOR-HES-13-001 HAZOP Study Rev.0

**ECO ORIENT RESOURCES (THAILAND) LTD**

**HAZOP STUDY REPORT**



Area	WB, L33 and L44		Department	PRODUCTION	
Project	HAZOP	Project No.: J1002	Section	ENGINEERING	
Location	WICHIANBURI, PHETCHABUN, THAILAND		Doc.No.	ED-ECOR-HES-14102-01	Rev. 0

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**HAZOP STUDY REPORT**



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**1.0 INTRODUCTION****1.1 General**

ECO Orient Resources (Thailand) Ltd and ECO Orient Energy (Thailand) Ltd (ECOR & ECOE) produces crude oil in the WB Concession area, L33 area and L44 area. As a characteristic of Well production. There are the difference well production in both lower and higher water cut that are produced in this area. In order to reduce gross liquid production, new dehydration and injection facilities shall be provided at this area.

These process design parameters will form part of the Basis of Design for the facility to be installed at field operation area. The information presented in this document have been extracted from various classification requested.

**1.2 Objective of Document**

The objectives of the HAZOP study are to identify and evaluate safety hazards and to identify operability problems which, although not hazardous, could compromise the process's ability to achieve design intent and productivity. In particular, the objectives of the study are to:

- Identify safety related hazards and operability problems related to the design and operation of the systems;
- Determine the seriousness of the consequences for the identified problems;
- Identify engineering design and procedural safeguards that will reduce the consequences related to the hazards;
- Evaluate the adequacy of engineering design and procedural safeguards; and
- Recommend additional safeguards and improvements, where necessary.

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**2.0 HAZOP BASIS AND DOCUMENTATION****2.1 Basis**

The basis for the HAZOP study is the P&IDs issued for design, marked-up with additional information. The HAZOP P&IDs with indicating the Nodes are presented in Attachment - 2.

**2.2 Documentation**

The following documentation is also made available during the HAZOP study and used as reference during meetings:

- Process flow diagrams
- Piping and instrument diagrams
- Material balance
- Plot plan
- Escape and Evacuation Layouts
- Major equipment data sheets (as required)

**3.0 HAZOP METHODOLOGY****3.1 Node of Study**

The process is broken down into manageable sections (nodes) based on the plant design and its complexity. Attachment -1 includes a list of nodes and their description. The design conditions, the identification numbers of equipment involved in the node and the reference drawing numbers are also included in the node listing. The Nodes are marked on the Master P&IDs, presented in Attachment -2

Some systems which are operated in side kick mode and/or operated intermittently are considered as a single node. Applicable guide words and deviations, which may differ from the generic list, are considered for analysis and recording.

**3.2 Guidewords / Parameters**

Each node is considered in detail to identify any potential problems in safety or operations that may arise due to deviations in the process parameters. The Causes and

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Consequences of each deviation were identified and the HAZOP team then evaluated the adequacy of existing safeguards, and where necessary, additional safeguards recommended as Actions.

**Table 3.1:** HAZOP Guidewords/Parameters and Related Deviations

Deviations	Guide Word	Parameter	Comment
No/Low Flow	No/Low	Flow	
More/High/Flow	More/High	Flow	
Reverse/Misdirected Flow	Reverse	Flow	
More/High Pressure	More/High	Pressure	
Low Pressure	Low	Pressure	Includes vacuum
More/High Temperature	More/High	Temperature	
Low Temperature	Low	Temperature	
High Level	High	Level	Includes interface high level
Low Level	Low	Level	Includes loss of level, interface low level and loss of interface level
Contamination	As well as	Composition	
Start-up/Commissioning	Others		
Shutdown/Maintenance	Others		Isolation, drain, purge
Utility Failure	Others		Includes air, power, and nitrogen
Others	Others		Other process and utility interconnections

## HAZOP STUDY REPORT

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**3.3 Worksheets**

The session proceedings are recorded using spreadsheet. The records are projected on a screen for comment and agreement by the team members during the sessions.

Although there are many formats for recording, such as recording by exception (where an entry is recorded only when the team makes a recommendation or the issue is considered significant), a full recording approach was adopted for all guidewords/deviations listed in

Attachment-3 whereby every deviation considered by team was recorded even when no significant causes or consequences were found. For guidewords/ deviations listed in Table 3.1, recording by exception was adopted.

**3.4 Recommendations**

A number of recommendations for changes to equipment, control systems, alarms and trips and procedures were identified during the HAZOP study, which, in the team's opinion, will improve the safety or the operability of the facility. A list of recommendations for the Generic is included in Attachment - 3. The completed HAZOP Review Action Sheets for each recommendation raised have been issued as a separate report, upon resolution of the actions raised.

**3.5 Assumptions**

Several assumptions were made regarding the basis of the design and these were generally agreed by the HAZOP study team. The main item is listed below:

In case of multiple equipments (with duty and standby/spare equipment) inside a unit, the study was conducted for one set of equipment. Similarly, in case of similar equipments in series, such as (Oil Storage Tank and Heater Treater) in series, the study was conducted on one Oil Storage Tank or Heater Treater only. The recommendations from this study will therefore apply for such similar systems as well. The study has however, considered the impact of simultaneous operation of systems in parallel or series including the control requirements and the effect of trip of one system on the other.

Power Generation Systems were not studied It is assumed that sufficient safeguards will be in place to ensure adequate and reliable supply



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## 4.0 HAZOP SESSIONS

## 4.1 Study Periods

The HAZOP Study for the Surface Production Facilities System will be planned on October 10, 2014 at ECO Orient Energy at Wichianburi Office 10:00 AM. A total of 1 day is spent on the HAZOP of this project.

## 4.2 Study Team

The HAZOP team comprised of a multidisciplinary team of personnel involved with the Project and having adequate experience of design, instrumentation, operations, maintenance, safety and loss prevention. Representatives from Engineering team (Process, Mechanical, Electrical, Instrument and Operation team, HSE team that participated in the HAZOP session. The details (names and discipline) of the HAZOP team members who attended the HAZOP sessions are presented in Attachment -1.

## 4.3 Follow Up

Proper follow-up and close-out of all recommendations have been monitored through the HAZOP Review Action Sheet.

## 5.0 APPENDICES

Attachment -1 – Attendance List

Attachment -2 – Node List

Attachment -3 – HAZOP Worksheets



## HAZOP STUDY REPORT

Area	WB, L33 and L44		Department	PRODUCTION	
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## Attachment -1 –Attendance List

## Study Team Attendance

Name	Company	Role	Date
		Chairman	10/09/14
		Scribe	
		Operation Leader	
		Sr. Supervisor	
		Supervisor – Well Test	
		Supervisor – Well Test	
		Supervisor – Well Test	
		Supervisor – Shift Operation	
		Supervisor – Shift Operation	
		Foreman - Shift Operation	
		Foreman - Shift Operation	
		Foreman - Shift Operation	
		Foreman - Shift Operation	
		Sr. Mechanical Engineer	
		Mechanical Draftman	
		Foreman - Piping & Installation	
		Foreman - Piping & Installation	
		Lead - Mechanical	
		Lead - Mechanical	
		Electrical & Instrument Engineer	
		Supervisor – Electrical & Instrument	

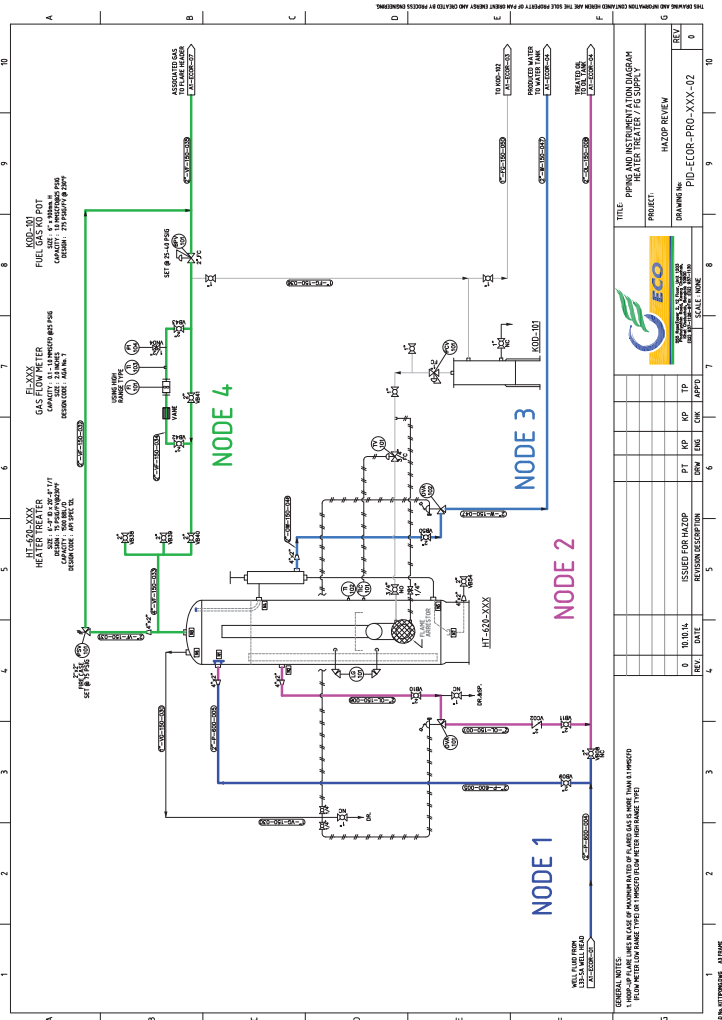
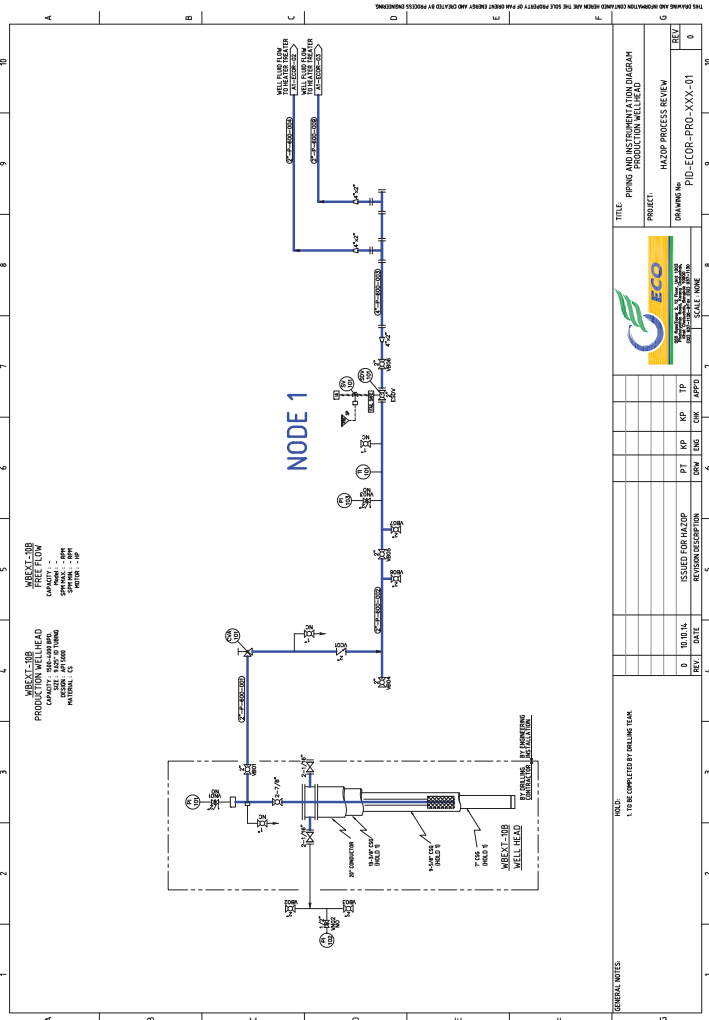
Name	Company	Role	Date
		Foreman - Electrical & Instrument	10/09/14
		Asset HSE	
		Asset HSE	
		Petroleum Technologist	
		Petroleum Technologist	

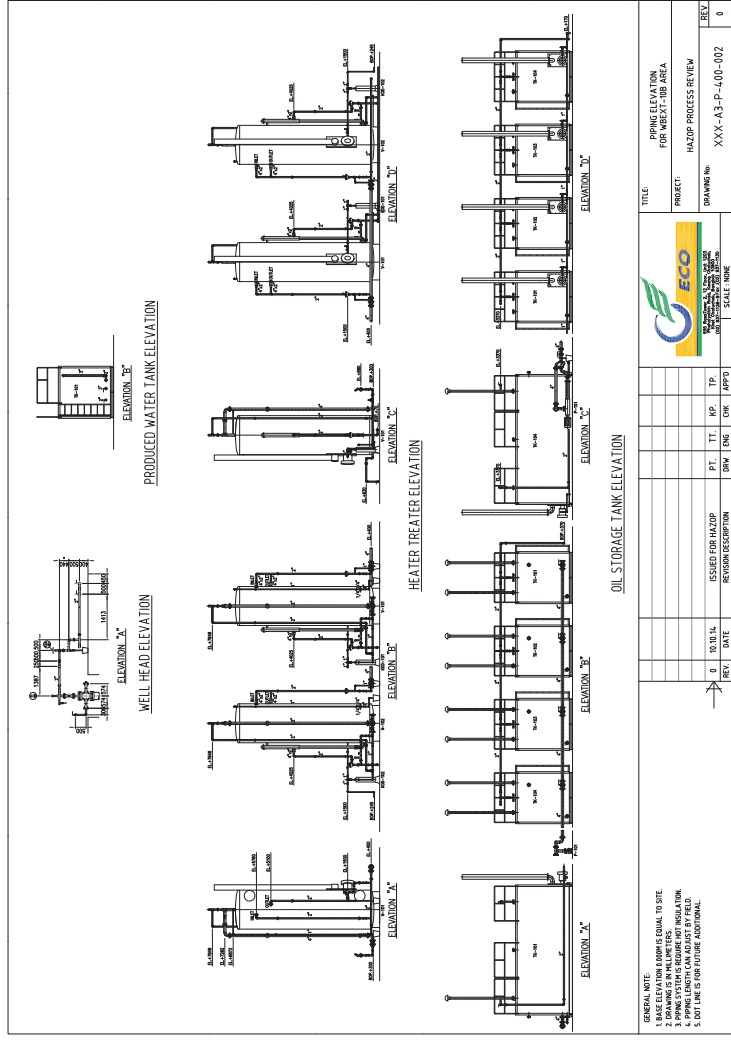




Project	HAZOP	Project No.: J1002	Section	ENGINEERING	
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### Attachment -2 –Node List







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Project	PWT AND INJECTION SYSTEM	Project No.: J0113	Section	Engineering	
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**Attachment -3 –HAZOP Worksheets**

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