Republic of the Philippines
DEPARTMENT OF ENERGY
(Kagawaran ng Enerhiya)

DEPARTMENT CIRCULAR NO. DC2021-06-0019
WIND SAFETY, HEALTH AND ENVIRONMENT CODE OF PRACTICE

WHEREAS, pursuant to Rule 2, Section 8 of Department Circular No. DC2012-11-0009, otherwise known as the "Renewable Energy Safety, Health and Environment Rules and Regulations (RESHERR)", and in order to ensure adequate safety and protection against the hazards to health, life, property, as well as pollution of air, land and water from Renewable Energy (RE) Operations, the following Wind Safety, Health and Environment Code of Practice are hereby promulgated.

GENERAL PROVISIONS

Section I. Safety, Health and Environment Policy Statement

1. It shall be the primary responsibility of the Employer to provide a safe workplace while protecting the health of the Workers and the surrounding environment. To achieve this, safety, health and environmental concerns must be thoroughly integrated in the Employer's management policy.

2. The Employer, as a matter of policy, shall:

   a. Issue a general safety, health and environment policy statement in writing in accordance with Rule 3, Section 9 of RESHERR;

   b. Give importance to the safety, health, and environmental aspect of their operation by creating a safety, health and environment committee under the direct supervision of top management;

   c. Establish a system to implement and monitor compliance of their contractors and sub-contractors to safety, health and environmental policy and related requirements of the company;

   d. Implement programs with corresponding budget allocation to ensure that relevant government safety, health and environmental rules, regulations and codes are complied with; and

   e. Establish an Emergency Preparedness and Disaster Management Plan to address any incident that may pose serious and imminent danger to the company's Workers, the environment and the community.

Section II. Definition of Terms

Terms and expressions that are generally defined in other existing regulations or in the Occupational Safety and Health Standards (OSHS) shall have the same meaning in this Department Circular. For purposes of this issuance, however, the following terms shall be defined as follows:

1. **Authorized Personnel** – refers to a Worker who has been trained and/or licensed/certified to do the task, as duly authorized by the Employer;

2. **Bureau** - refers to the Renewable Energy Management Bureau (REMB) of the Department of Energy;

3. **Confined Space** – refers to any area that has hazardous atmosphere, with restricted means for entry and exit and/or not designated for continuous worker occupancy;

4. **Employer**- refers to the principal employer, service/operating contractor referred to in a RE Service/Operating Contract, and other contractors or subcontractors, engaged in RE Operations, natural or juridical, whether acting alone or in consortium with others, who directly or indirectly benefits from the services of the employees;

5. **Environment** – refers to the Workplace Environmental Measurement as provided for in OSHS;

6. **Meteorological Tower/Meterological Mast/Met-tower/Met-mast** – A tower, either permanent or temporary, used at a project site which has equipment (e.g. data loggers, anemometers, wind vanes, temperature and pressure sensors, etc.) attached to it which is designed to gather, record and possibly transmit meteorological data;

7. **Procedure** – refers to a formal step-by-step instruction describing how a specific task or work activity should be done;

8. **Program** – refers to a plan under which action may be taken toward a goal;

9. **SDS**- refers to Safety Data Sheet, which is intended to provide workers and emergency personnel with procedures for handling or working with a substance in a safe manner, and includes information such as physical data (melting point, boiling point, flash point, etc.), toxicity, health effects, first aid, reactivity, storage, disposal, protective equipment, and spill-handling procedures;

10. **Standard** – refers to specifications or guidelines on how things should be done;

11. **System** – refers to an organized scheme of how things are done; includes procedures, policies describing how an organization works; and

12. **Worker**- refers to any member of the labor force, regardless of employment status.

Section III. Safety, Health and Environment Practices

The Employer is required to formulate and implement a Safety and Health Program which shall be in consonance with the provisions of Republic Act (RA) No. 11058. The Employer shall prepare and allocate a budget to implement the Safety and Health Program. The Safety and Health Program shall include, among others, the following safety measures:

A. General Safety

1. Office Safety

a. An office maintenance and housekeeping program shall be in place, in accordance with Section III.A.3 hereof;

b. Horse playing shall be prohibited within company premises;

c. Only Authorized Personnel shall operate equipment and appliances;
d. Electrical equipment and appliances shall be immediately shut-off when not in use;

e. Smoking shall only be allowed in the designated smoking area; and

f. An ergonomics program shall be in place to address potential ergonomics hazards from work procedures in order to minimize stress to the musculo-skeletal system to prevent repetitive stress injury.

2. Personal Protective Equipment (PPE)

a. Employer shall have a PPE program in place;

b. Employer shall provide adequate PPE available at all times, in conformity with the approved design and specification appropriate for the exposure and the work to be performed that meets at least the minimum OSHS requirements or applicable industry standards such as ANSI, ASTM, etc. and shall bear no cost to Workers;

c. Workers shall be properly trained on the selection (fit-test), use, storage and maintenance of approved PPE;

d. All work activities/workplaces requiring the use of PPE shall be identified;

e. Employer shall communicate to concerned Workers the use of the required PPE. Adequate signs/warnings shall be posted in areas requiring PPE;

f. PPE shall be inspected regularly and properly maintained to its good condition. Use of defective/damaged PPE is prohibited;

g. All Workers shall comply with PPE requirements in accordance with Section III.A.2 hereof;

h. Hard hat shall be worn in designated "HARD HAT AREA;"

i. Appropriate eye protection shall be worn while handling chemicals, while in areas or activities with exposure to dusts, or any operations that can cause eye injuries;

j. Face shields shall be worn as protection against flying particles, sprays or hazardous liquid, splashes of molten metals and hot solution;

k. Appropriate hearing protection shall be worn in areas where the noise level reaches 85 decibels and above for 8-hour exposure;

l. Appropriate respiratory protection shall be worn in areas where air-borne contaminants such as toxic materials, fogs, gases, fumes, mists, sprays or vapor and dusts are present;

m. Appropriate gloves shall be worn when handling toxic materials and working on energized electrical circuit or apparatus;

n. When performing hot works, appropriate PPE shall be worn such as but not limited to welding masks, respirator, gloves, aprons and leggings designed for heat protection. Head protection shall be worn when necessary;

o. All Workers exposed to extreme temperatures shall wear appropriate PPE in accordance with Section III.A.2 hereof;

p. Full body harness and/or lifelines shall be properly worn while working at heights 6 feet (2 meters) or more above ground in pits, tunnels, ducts and other confined spaces. Lifelines shall be securely fastened/anchored while in use; and

q. Safety shoes shall be worn in areas where they are required.

3. **Housekeeping**

Employers shall devise procedures or guidelines for the following concerns, in accordance with existing laws and regulations:

a. Obstructions (i.e., passageways, aisles, ingress and egress);

b. Domestic and process waste management (i.e., generation, collection, segregation, storage and disposal);

c. Storage and stacking of materials, tools and equipment;

d. Signage (directional/instructional);

e. Barricades and zoning;

f. Building and ground maintenance of offices and field facilities;

g. Pest and rodent control; and

h. Control for stray animals.

4. **Laboratory Safety**

a. All chemicals, sample containers and generated wastes shall be properly handled, stored, labeled and dispose in accordance to Republic Act No.

6969 also known as the *"Toxic Substances and Hazardous and Nuclear Waste Control Act of 1990;"*

b. The SDS of all chemicals and/or Hazardous Materials in storage or in use shall be made available for reference at all times;

c. Applicable chemicals and reagents used in the laboratory shall have the permits and licenses from regulatory bodies (i.e., Department of Environment and Natural Resources - Environmental Management Bureau, Philippine National Police, Philippine Drug Enforcement Agency etc.);

d. Safe work procedures for the following task shall be provided and reviewed/evaluated periodically:

   i. Geoscientific and Environmental Sampling;
   ii. Field Data and Sample Gathering;
   iii. Laboratory Analysis;
   iv. Laboratory Instrument Operation;
   v. Chemical Handling; and
   vi. Waste Collection, Storage, Transport, Treatment and Disposal.

e. All work involving hazardous and volatile materials shall be done in the fume hood;

f. Smoking is strictly prohibited in the laboratory area;

g. Compressed gas cylinders shall be stored, transported and handled in accordance with Section III.M hereof;

h. All instrument plugs, cables and power outlets shall be labeled with their corresponding power ratings;

i. Eye wash stations and emergency showers shall be available in designated areas and regularly maintained; and

j. Laboratory Instruments should be calibrated based on Operating Manual.

5. Safety Signage

Safety signage and devices shall be posted in prominent positions at strategic locations in a language understandable to all, and in accordance with the provisions of Republic Act No. 11058 and its Implementing Rules and Regulations.

6. Duties and Responsibilities of a Safety Officer

a. Oversee the overall management of the safety, health and environment program;

b. Frequently monitor and inspect safety, health and environment aspect of the operation being undertaken with the participation of supervisors and workers;

c. Assist government inspectors in the conduct of safety, health and environment inspection and/or during the conduct of an accident investigation; and

d. Issue work stoppage orders when necessary based on the requirements and procedures provided by the OSHS.

7. Safety Orientation

All visitors and contractors must complete a site specific safety induction to be aware of all safety rules and regulations and emergency procedure applicable to the worksite.

8. Buddy System

a. Employer shall implement the buddy system to high risk activities such as but not limited to the following:

i. working at heights;
ii. working with electricity;
iii. working at confined spaces;
iv. working with hazardous substances and equipment;
v. working with materials at great pressure;
vi. working with public, where there is potential for violence;
vii. working with various kinds of terrain; and
viii. working with bodies of water.

b. Where lone working with high risk is required, Worker shall ensure they have another colleague aware of their movements. To operate the buddy system, the Employer shall assign a buddy. This is the person who is the contact for the period in which the said Worker is working alone. The assigned buddy shall be:

i. be fully aware of the movements of the lone Worker;

ii. have all necessary contact details for the lone Worker, including next of kin;

iii. have details of the lone Worker's known breaks or rest periods;

iv. attempt to contact the lone Worker if they do not contact the buddy as agreed;

v. follow the agreed local escalation procedures for alerting their senior manager and/or police if the lone Worker failed to contact the buddy within agreed and reasonable timescales; and

vi. contingency arrangements shall be in place for someone else to take over the role of the buddy in case the assigned person is unavailable.

9. **Worker Training**

a. All Employer shall ensure that Workers attend a fit for purpose Safety training. This training may be conducted by the Safety Officer, DOLE accredited Safety Training Organizations, Safety Practitioners or Safety Consultants; and

b. Where applicable, TESDA training and certifications, shall be required for special kind of works (i.e., Electrician, Scaffold Erector, Rigger Crane Operator, etc.).

B. Safety, Health and Environment Plan

Safety, Health and Environment (SHE) planning begins with anticipating and understanding safety, health and environment hazards in the workplace and assessing consequent risks and opportunities to protect people, the environment and the business. Risks are addressed by levels of management appropriate to the nature and magnitude of the risk. The early recognition, identification and understanding of applicable laws and regulations, stakeholder expectations and emerging issues during the business planning phase are helpful in evaluating risks and opportunities.

a. Prior to the performance of work, Employers shall submit a SHE Plan, duly signed by the Project Manager and specific to the project. The SHE Plan shall describe the safety, health and environmental issues and risks associated with the work;

b. SHE Plan shall be based on, and comply with, applicable laws, decrees, administrative rules and regulations, relevant Employer policy and operating procedures, and relevant best practices;

c. If a SHE Plan is required by local regulations, Employer shall not start work without a SHE Plan that has been accepted by local authorities having jurisdiction;

d. Prior to starting work, all Workers shall participate in a safety, health and environmental protection orientation with a designated Employer representative; and

e. Prior to starting any work, Employer shall perform a Job Hazard Analysis (JHA). The JHA shall:

i. carefully study and record each step of a job;

ii. identify existing and/or potential equipment, environmental, or action-generated job hazards; and

iii. determine the best way to perform the job to reduce or eliminate hazards. During a daily pre-task tool box meeting, Employer shall ensure that the JHA is communicated to and fully understood by all Workers who will participate in the performance of the work. Employer shall ensure that the JHA has been communicated to and fully understood by all Workers as indicated by the signatures of the Workers concerned in an attendance sheet of that meeting.

C. Emergency Preparedness and Disaster Management

Emergency preparedness and an effective execution of response actions help protect Workers, contractors, the public, and the environment in the event of an accident.

a. Develop site specific emergency preparedness and disaster management plans to ensure the safety of our Workers, contractors, operations, and affected communities and prevent loss of life, serious injury, or significant environmental or public health impacts;

b. Provide the necessary human, equipment, and material resources to execute the emergency response plans;

c. Communicate emergency preparedness and disaster management plans to Workers, contractors, communities, regulatory agencies, and other stakeholders. Coordinate these plans with outside authorities and establish clear roles, responsibilities, and resources;

d. Plan and conduct periodic emergency and evacuation drills to ensure a constant state of operational readiness to respond to actual incidents;

e. Review and revise, where necessary emergency preparedness and disaster management plans after a critique of drills or actual emergencies. Apply corrective and improvement actions and monitor to ensure completion. Share best practices and lessons learned with others;

f. Align and integrate emergency preparedness and disaster management plans with business; and

g. Implement, as and when required, site specific emergency preparedness and disaster management plans with a sense of urgency to ensure the safety and health of people, operations and affected communities and prevent loss of life and property, serious injury, or significant environmental or public health impacts.

D. Safety and Health Communication Program

Establish a culture that encourages and promotes open communication and informed decision making shall be maintained. Safety and Health information will be shared in a timely manner with management, Workers, business partners, the public and key stakeholders through the various channels available.

To strengthen and reinforce an effective safety and health culture. The Safety and Health Communication Program may include, but is not limited to:

a. Monthly safety meetings;
b. Use of Safety and Health Bulletin Boards;
c. Safety posters, announcements and other materials used to support the on-going safety programs and activities;
d. Use of Company intranet and Safety and Health webpage;
e. Safety and Health Performance Awards for Individuals, Groups, and Contractors;
f. Lessons Learned Bulletins and First Alerts;
g. Contests (slogans, posters, suggestions, etc.); and
h. Surveys and Questionnaires.

E. Incident Reporting and Investigation

Develop, implement and maintain standard processes for reporting and investigation of hazards, injuries, illnesses, incidents and any other systems failures that may affect the safety and health of Workers, contractors and the community and which may adversely impact the environment. Procedures shall enable the Employer to:

a. Report to the and DOLE Regional Office having jurisdiction over the workplace, in writing, all accidents, fatality and the result of the investigation of all Lost Time Accidents with or without major losses / damages in accordance with Rule 4 Section 14 Notification and Reporting of the RESHERR;

b. Utilize the fastest available means of communication and shall be made within twenty-four (24) hours after occurrence of any, but not limited to, the following incidents:

    i. Fatal accidents;
    i. Hospitalization of three (3) or more persons;
    ii. Accidental detonation of explosives including blasting agents;
    iii. Explosion or blowout;
    iv. Accidental or over-exposure to ionizing radiation;
    v. Accidental exposure to immediately dangerous to life and health levels of toxic substances; and
    vi. Property damages amounting to One Million Pesos (Php1,000,000.00)

c. Investigate incidents (including near misses) by Authorized Personnel to identify and analyze root causes and system failures; and

d. Identify and implement corrective actions and continual improvement opportunities in order to prevent future incidents, based on generated incident data and incident investigations.

F. Workplace Monitoring and Control

1. Permissible Noise Exposure

a. Employer shall have a hearing conservation program in place for exposed Workers; and

b. Employer must comply with noise exposure threshold under OSHS.

2. Illumination

a. As applicable, skylights and windows shall be located and spaced so that daylight conditions are fairly uniform over the working area;
b. All occupied offices and buildings, including perimeters, shall be properly illuminated during normal operation based on OSHS;

c. Adequate automatic emergency lighting system shall be provided in all stairways, exits, workplaces and passages, as required by the Philippine Building Code and the Fire Code of the Philippines and OSHS; and

d. Adequate ground lighting shall be provided within the working premises as required under OSHS.

3. General Ventilation

Suitable atmospheric conditions shall be maintained and adequate ventilation shall be provided in all work areas by natural and/or artificial means. Measures shall be taken to minimize, if not eliminate, process-related airborne hazards such as dusts, gases, odor, vapor, or mists at the source.

4. Extreme Temperature

a. All Workers exposed to extreme temperature shall wear suitable PPE;

b. All equipment and facilities shall undergo re-evaluation for possible redesign or engineering control to minimize temperature hazard; and

c. Risk assessment shall be done where there is possible exposure to extreme temperature.

5. Radiation

a. All potential sources of electro-magnetic radiation, such as switchyards, high voltage power lines and transformers, shall be identified, and isolated (fenced). Only Authorized Personnel have access to this area;

b. Authorized Personnel operating radiographic equipment and conducting radiographic inspections must ensure work is in accordance with applicable regulations;

c. All works and materials emitting radiation, such as but not limited to radiographic testing and naturally occurring radioactive materials from drilling, shall be covered by appropriate permit and signage;

d. Radiographic testing area must be designated and identified as a Restricted/High Hazard area and roping off or barricading the area is required. Warning signs must be placed in conspicuous locations around the work area to ensure all Workers on site are made aware that hazardous work activity is taking place and must remain in place until all the radiographic activities have been completed;

e. Personal dosimeters such as thermoluminescent dosimeters and direct reading dosimeters shall be worn by radiographers at all times when they are performing site radiography work;

f. Work shall be conducted to the degree possible, when only a minimum number of Workers are in the vicinity such as after normal work hours; and

g. Vessels or pipes being tested must be adequately drained of all liquids prior to the tests being conducted.

G. Lock-Out, Tag-Out and Try Out (LOTOTO) Procedures

1. All LOTOTO shall be covered by work permit system;

2. Only Authorized Personnel shall be allowed to conduct LOTOTO;

3. Required PPE shall be used in accordance with Section III.A.2 hereof;

4. All affected Workers must be notified in a timely manner that a LOTOTO system is going to be utilized and the reason thereof. The Authorized Personnel shall know the type and magnitude of energy that the machine or equipment utilizes and shall understand the hazards;

5. If the machine or equipment is operating, it shall be shut down by following the normal stopping procedure (i.e., depress stop button, open toggle switch, etc.);

6. Lock-out and tag-out shall be applied on the energy isolating devices with assigned individual lock(s) and tag(s);

7. The proper blocking, braking and securing devices of all equipment shall be activated and installed. All stored or residual electrical, gravitational, mechanical and/or thermal energy must be disconnected and drained to a zero-energy state by bleeding, venting, grounding, or other approved means or otherwise made safe by the blocking or repositioning of equipment;

8. After ensuring that no Workers are exposed and as a check if the energy source has been fully disconnected, the push button or other normal operating controls shall be tested to ensure that the equipment will not operate;

9. All affected Workers shall be notified, that the machine or equipment has effectively been isolated and that lock-out and tag-out devices are in place;

10. After completing the servicing or maintenance and the equipment is ready for normal production operations, the area around the machines or equipment shall be checked to ensure that no Worker is exposed;

11. After all tools have been removed from the machine or equipment and guards have been reinstalled, all lock-out and tag-out devices shall be removed;

12. The energy isolating devices shall be operated to restore energy to the machine or equipment;

13. All affected Workers shall be notified that the machine or equipment has effectively been energized and is ready for use; and

14. Lock-out and tag-out devices shall not be used for other purposes and shall be used only for controlling energy.

H. Electrical Works Requirements

1. All electrical works shall be covered by work permit system;

2. All electrical systems, works and materials shall conform to the latest Philippine Electrical Code;

3. Only Electrical Practitioner authorized by the Employer shall supervise all electrical works in consonance with Republic Act No. 7920 also known as the *"New Electrical Engineering Law of 1995."*

4. Only duly qualified, competent and authorized Electrical Practitioner shall be allowed to carry out inspection, testing and repair of electrical installations and equipment;

5. A Buddy System must be practiced for all electrical works (120V and above);

6. Prior to any electrical task, Workers working with electricity must remove all metal jewelry;

7. Required PPE shall be used in accordance with Section III.A.2 hereof;

8. Required clearance shall be observed when working near high-voltage lines or equipment in accordance with the latest Philippine Electrical Code. Appropriate protection and/or insulation of high-voltage lines (i.e., powerline cover or protective conductor cover) and barricades shall be provided and installed;

9. Materials, tools and equipment shall be inspected before and after for any wear and damages that may expose the Workers to electrical hazards;

10. Electrical tools and equipment shall be properly guarded and grounded;

11. Electrical tools and equipment shall have Inspection and Maintenance Program;

12. Proper warning and instructional signs shall be visibly posted at all times when work is being performed, and shall be removed or recovered promptly after work is completed;

13. No circuits are to be energized without first informing and receiving clearance from a supervisor/site manager, manager or appropriate site personnel;

14. Appropriate lock-out, tag-out and try-out procedures shall be implemented and observed in accordance with Section III.G;

15. Areas and cabinets with electric power shall be properly marked with signs;

16. First aid shall be available during all electrical works; Emergency response team, depending on criticality of the activity shall be available during electrical works;

17. Hazardous electrical wastes shall be properly managed; and

18. Electrical safety education and training shall be provided to ensure that Workers are knowledgeable in performing their tasks safely.

I. Demolition Requirements

1. Before any demolition work is started, Authorized Personnel experienced in demolition operations must be appointed in writing as the person responsible for all work on site. The duties of Authorized Personnel shall include the direct supervision of the work force, ensuring that work permit requirements are met, and liaison with other contractors working in the general area and with operators and construction or maintenance engineers;

2. The original drawings of the structure to be demolished shall be obtained. These shall be examined to ascertain whether any major changes from the original construction have been made and where utility connections may be found;

3. The method of demolition to be used should be decided upon in consultation with all Workers involved. The re-use of salvage materials shall be considered prior to this decision;

4. All utility services such as steam, electricity, instrumentation, gas, and water must be shut off and the main supplies disconnected outside the line of the demolition work. Tanks, vessels, and pipelines must be completely disconnected from inlet, outlet, and overflow points;

5. Adjacent structures, buildings, pedestrian walkways, parking lots, etc. shall be protected from demolition debris that can likely cause hazards to the general public. Also, bracing must be installed to ensure stability of adjacent structures;

6. Barricades must be erected around the work area. Visible signs bearing the words "Danger - Demolition in Progress" in must be in place;

7. Traffic management plans shall be in place when work is being done as necessary;

8. Before demolition of structures and facilities with asbestos and insulation or removal of equipment containing Polychlorinated Biphenyl (PCBs) or any other hazardous material, the Worker shall notify the Supervisor to ensure safe procedures are followed. Proper PPE and hazardous materials disposal procedures must be utilized;

9. A safe means of access to and egress from all demolition areas and working places must be provided. Work places and the areas around ladders and stairways must be kept clear of material and debris;

10. Nails in timber must be removed or bent over, or the timber must be stacked where it will not be a source of danger. All glass in windows, doors, partitions, etc. shall be completely removed prior to structural demolition;

11. All steel construction shall be demolished column length by column length and tier by tier. A structural member being removed must not be under any stress other than its own weight. Members being cut or dismantled shall be chained or lashed in place to prevent uncontrolled swinging or dropping;

12. No tank, vessel, or pipe work which has contained explosive or flammable material shall be subjected to welding or hot cutting operation until all steps have been taken to remove the substance and any vapors;

13. Mechanical equipment such as cranes and bulldozers should be equipped with wire mesh guards over windows and with solid protection over the driving position so that there is no danger of the operator being struck by flying debris; and

14. As work progresses, continuing inspections must be made to detect hazards arising through weakened or overloaded floors, unsupported walls, or loose material. Immediate steps shall be taken by bracing or by other means to prevent the premature collapse of the whole or any part of the structure.

J. Working in Confined Spaces Procedures

1. Standard work processes shall be developed, implemented and maintained to ensure that work involving the entry of Workers into confined spaces has been assessed and approved of by an Authorized Personnel;

2. The entry into the confined space shall be administratively controlled using a work permit system;

3. The confined space must be properly isolated and all hazardous energy sources are controlled;

4. The atmosphere inside the confined space must be gas-tested by an Authorized Personnel using properly calibrated equipment in this order:

   a. Check for Oxygen Content – Oxygen level should be at least 19.5% and not more than 23.5%;

   b. Check for Combustibles – Flammable atmosphere should be less than 10% of the Lower Explosives Limit (LEL) – (0% is preferred); and

   c. Check for Toxic Gases:
      i. Hydrogen Sulfide (H_2S) – should be less than 10 ppm;
      ii. Carbon Monoxide (CO) – should be less than 25 ppm; and
      iii. Any other hazardous gases present.

   If any of the above is present over normal levels, the area shall not be entered until ventilation by blower is effected;

5. The atmosphere inside the confined space must be monitored and controlled within the limits set for occupational exposure;

6. Approved types of breathing apparatus and other PPE shall be provided and made available for use by the Worker/s entering a confined space;

7. No Worker/s shall enter a confined space unless a watcher is available. The watcher must be familiar with the job and shall maintain contact with the Worker/s in the confined space and be equally provided with breathing apparatus for ready use in case of emergency;

8. Each entry point shall have one dedicated Attendant to control access to the space. Access shall be restricted only to Authorized Entrant;

9. At least one Worker who shall enter the confined space shall wear a properly calibrated and functioning personal multi-gas monitor;

10. Where necessary, Emergency Response Team must be in place;

11. All Workers involved must have attended an appropriate confined space entry training course;

12. No smoking or open lights, torches, arcs or flames shall be permitted in confined spaces until an inspection has been conducted to ensure that fire or explosion possibilities have been eliminated;

13. No spraying or painting using volatile solvents of oil shall be undertaken in confined spaces unless the necessary respiratory and other adequate protections are provided;

14. Any manhole, tank opening, or other opening which is left unattended shall be protected by barricades, provided with appropriate warning signs and sufficient lighting.

15. Adequate means of ingress and egress from any confined or enclosed space shall be provided;

16. Activities involving welding or cutting in confined spaces shall conform with OSHS; and

17. Other applicable procedures in accordance with Safety in Confined Space Manual of DOLE shall be adopted.

K. Work Permit System Procedures

1. Established work permit system procedures shall be implemented in the following works:

   a. Electrical and Mechanical LOTOTO;
   b. Confined Space Entry;
   c. Hot Work;
   d. Excavation;
   e. Hazardous Materials Handling;
   f. Work at Heights;
   g. Critical Lifts;
   h. Radiation;
   i. Blasting;
   j. Demolition;
   k. Bypassing Critical Protection;
   l. Simultaneous Operation; and
   m. Any activity that may adversely affect the safety and health of people and the environment and has a significant potential for injury or environmental incident;

2. The above permit shall include the minimum applicable requirements:

   a. Permit Number;
   b. Authorized permit Requestor and Issuer/Approver;
   c. Date of Issue;
   d. Work Methodology and Description (Area/ Activity Covered);
   e. Period of Validity of Permit (Date and Time);
   f. Work Precaution Checklist;
   g. Protective Measure Checklist;
   h. Work Party Acceptance;
   i. Emergency Response/Equipment;
   j. Environment Monitoring;
   k. Job Hazard Analysis and Control;
   l. Work Carry Over (Turnover of Unfinished Work); and
   m. Sign Off (Closing);

3. Control for issuance and recording of all permits shall be established;

4. Permits shall be properly posted in the work area;

5. Work covered by permit shall be immediately stopped if permit conditions are not complied with/violated or emergency incident/accident occurs;

6. Control for the recording and monitoring of all permits that were stopped and revalidation and resolution of action items to address the compliance issues or violations shall be established;

7. An assessment shall be conducted to determine the need for work permit system on other facilities and equipment on site;

8. Workers affected by the work permit system procedures shall be trained on the application procedures. Permitting authorities shall likewise be identified and properly trained; and

9. A periodic safety audit shall be in place to determine its adequacy on compliance and effectiveness.

L. Hazardous Materials Handling, Storage and Disposal

1. Toxic chemicals and hazardous waste/substances shall be properly managed, handled, stored, transported and disposed) in accordance with Republic Act No. 6969 also known as the *"Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990"*;
2. All related SDS shall be readily available and communicated to Workers for information and reference;

3. Provide a register on site detailing the movement, storage, use and disposal of all hazardous materials and dangerous goods, including hazardous wastes and other by-products;

4. The following details must be made known:

    a. Material description including:

        i. Product Name;
        ii. Source or Manufacturer;
        iii. Use or Purpose; and
        iv. Quantity stored, used and disposed;

    b. All potential hazards to health or risks to the environment, resulting from the work being undertaken;

    c. A copy of risk assessment relating to its specific use;

    d. Work procedures and methods of safe handling required for safe storage, use and disposal so that any human exposure, emissions to atmosphere, or discharge to land or water are avoided or minimized;

    e. Required permits of use, storage and disposal by local and national regulations;

    f. Information and training requirements on the hazardous substances;

g. Method of removal of any unused materials or by-products from the site upon completion of work;

h. Method of disposal that meets safety, health, and environmental regulations; and

i. Emergency response measures required if an incident involving such materials happened onsite or offsite;

5. All Workers that maybe exposed to chemicals shall be trained on the recommended hazard controls of various chemicals used in the workplace;

6. Chemicals shall be stored according to storage requirements as stated in the SDS with consideration of storage compatibility with other chemicals;

7. The appropriate PPE should be worn as prescribed in the work permit system, as stated in the instruction/procedure or as advised by the supervisor; and

8. All exposed Workers shall be given immediately proper medical attention for any untoward effects from handling toxic chemicals and hazardous wastes/substances.

M. Compressed Gas Handling and Storage

1. Gas cylinders shall be chained/supported in an upright position at all times and should be placed in a secured and well-ventilated area;

2. Cylinder cap shall be properly installed when the cylinder is not in use and when being moved/transported;

3. Gas cylinders shall be labeled, appropriately stored and secured in designated areas and shall conform to the requirements of all applicable industry and regulatory standards;

4. All hoses, gas regulators and other accessories shall be regularly inspected and maintained;

5. Appropriate shut-off tool/spanner shall be readily available for use;

6. Flashback arresters shall always be available and properly installed;

7. Compressed gas cylinders are prohibited inside confined spaces; and

8. Appropriate handling equipment (cart or wheeler) shall be used when transferring cylinders.

N. Flammable Liquids Handling, Storage, Labelling and Disposal

1. Flammable liquids shall be properly stored, labeled, handled and disposed of according to recommended controls, as specified in the SDS, in accordance with applicable OSHS and/or DENR Standards;

2. Approved safety pumps and similar devices shall be used when transferring liquids from one container to another. Motorized pumps shall be properly grounded;

3. Appropriate safety containers shall be used in handling or transporting flammable liquids;

4. Adequate fire control and fire-fighting equipment shall always be available in areas where flammable liquids are present;

5. Flammable liquids shall not be discharged into the sewers, drainage, canals or natural waterways;

6. Empty flammable containers shall be disposed of in accordance with the manufacturer's instructions and local regulatory requirements; and

7. Hauling of flammable and/or combustible liquids must be in compliance with DENR standards.

O. Explosives Storage, Use, Transportation and Disposal

1. The government laws pertaining to the use, storage and transportation of explosives shall be strictly observed. Manufacturer's instructions for the safe handling and storage of explosives are shall be followed;

2. Disposal of all empty explosive containers shall be in accordance with manufacturer's recommendations and local regulatory requirements;

3. Blasting machines and equipment are to be disconnected from firing circuit by switching to "safe" or "unarmed" position before and after a charge is fired;

4. Worker/s who handle, prepare, loads, fires, burns or destroys an explosive are certified blasters or working under the direct supervision of a certified blaster;

5. Explosives and explosive devices shall be transported in accordance with all applicable regulations and shall be provided with the appropriate security escort at all times;

6. The loss or theft of explosives from a worksite shall immediately be reported to the nearest authorities and to Supervisor in charge;

7. Warning signs about the use of radio transmitter must be posted on all access roads 1000 feet from the blasting area;

8. All access points to the blasting area shall be properly guarded until an "ALL CLEAR" signal is sounded;

9. Explosives or dynamites used for quarrying or road construction shall be stored in magazines as per regulatory standard;

10. Dynamites shall be separated from the blasting ingredients such as blasting caps or fuses when stored or transported;

11. For security reasons, vehicles transporting explosives shall not be marked unless required;

12. Only Authorized Personnel shall handle explosives;

13. Explosive magazine shall be constructed as per standards. Danger signs shall be installed to warn the public. Explosive magazine shall be provided with at least two ventilation outlets;

14. Stacking/piling of boxes of explosives shall only be on eye level;

15. Perimeter gates and doors of the storage magazine shall be provided with two (2) locks each. One for the military and one for the company custodian;
16. Only Authorized Personnel shall be allowed to enter the storage areas or near explosives;

17. Smoking is strictly prohibited in areas where there are explosives; and

18. Military escorts must be present during transport of explosives.

P. Warehouse Safety

1. Warehouses shall be well-ventilated and well-lighted. The lighting specification and requirement shall be in accordance to the latest Philippine Electrical Code, the DOE Manual of Practice on Efficient Lighting and/or the Institute of Integrated Electrical Engineers of the Philippines, Inc.'s (IIEE) Manual for LEED Compliant Lighting System Design;

2. If a warehouse is provided with fire sprinkler system, it must conform with the National Building Code;

3. Storage areas shall be provided with adequate fire extinguisher located at strategic places in accordance with the Fire Code of the Philippines;

4. Adequate clearance between stocks and wall, and between aisles, shall be provided for easy access;

5. Warehouse shall be provided with enough space for the operation of material handling equipment;

6. Materials stored in open areas shall be protected against the weather, and shall not be placed in direct contact with bare soil or ground;

7. Eyewash stations must be available in designated areas and shall be regularly maintained; and

8. Shelves shall be labeled to indicate the capacity they can carry.

Q. Ladder Safety

1. Inspect ladders prior and after use to ensure their good state. Take out of service immediately damaged or defective ladders, report them to management, and tag on them a warning sign so they will not be used until properly repaired or replaced;

2. Maintain ladders free of oil, grease and other slipping hazards;

3. Do not load ladders beyond their maximum intended load nor beyond their manufacturer's rated capacity;

4. Use ladders only for their designed purpose;

5. Use ladders only on stable and level surfaces unless secured to prevent accidental movement;

6. Do not use ladders on slippery surfaces unless secured or provided with slip-resistant feet to prevent accidental movement;

7. Secure ladders placed in areas such as passageways, doorways or driveways, or where they can be displaced by workplace activities or traffic to prevent accidental movement, or use a barricade to keep traffic or activity away from the ladder;

8. Use ladders equipped with nonconductive side rails if the Worker or the ladder could come in contact with exposed energized electrical equipment;

9. Always maintain a 3-point (two hands and a foot, or two feet and a hand) contact on the ladder when climbing/descending. Keep your body near the middle of the step and always face the ladder while climbing/descending;

10. Do not carry objects or loads that could cause loss of balance and falling;

11. Parallel, level and uniformly space ladder rungs, cleats and steps when the ladder is in position for use;

12. Do not tie or fasten together ladders to create longer sections unless they are specifically designed for such use;

13. If the total length of the climb on a fixed ladder equals or exceeds 24 feet (7.32 meters), equip the ladders with safety devices or self-retracting lifelines and rest platforms;

14. Immediately mark defective or tag with "DO NOT USE" or similar language and withdraw from service until repaired ladders with structural defects—such as broken or missing rungs, cleats or steps, broken or split rails, corroded components or other faulty or defective components;

15. Never move, "walk" or "jog" a ladder while you are on it. Go down first and the reposition the ladder;

16. Do not climb while holding something-use tool belt to carry tools. If need to move equipment to the roof that cannot be fastened or carried safety in a tool belt, tie of properly, using fall protection, and use a rope or hoist to raise and lower tools and other objects;

17. Allow only one Worker on a ladder at time;

18. Always move the ladder to avoid overreaching;

19. Never leave raised ladders unattended;

20. Always work within an arm's reach from the ladder, keep both feet on the rungs and use belt buckle as a guide to keep weight centered on the ladder during all times;

21. Be sure that the shoes are free of mud, grease or other substances which could cause a slip of fall; and

22. Free the areas around the top and base of ladders from tripping hazards such as loose materials, trash and electric cords.

R. Lightning Protection

1. Lightning protection system shall be installed in wind project structures and lifting equipment, especially on facilities with sensitive electronic equipment;

2. Installation of lightning protection shall be done by trained and qualified lightning protection specialists;

3. For quality assurance, all materials and methods shall comply with nationally recognized safety standards for lightning protection as established by National Fire Protection Association/latest Philippine Electrical Code;

4. Other electrical works shall be in placed as prescribed in Section III.H hereof; and

5. Required PPE shall be used in accordance with Section III A.2 hereof.

S. Facility Improvement Works

1. **Excavation and Filling Works**

   a. All excavation and filling works shall be covered with appropriate work permit system;

   b. Only Authorized Personnel shall supervise all excavation and filling works;

   c. Roles must be clearly defined, and Workers must meet the training requirements for excavation and filling works;

      i. A Civil Engineer or Qualified Professional shall be employed for the analysis of soil types and conditions;

ii. Excavation in close proximity to building, roads, retaining walls and other structures or deeper than 20 feet (6.1 meters) must be reviewed and approved by a Civil Engineer or Qualified Professional; and

iii. Protective systems (i.e., shoring, bracing, sloping, benching, and shields) for excavations 4.9 feet (1.5 meters) deep shall be designed by a Civil Engineer;

d. Before any excavation is started, available drawings/plans, electronic and/or other appropriate equipment to locate underground pipelines, electrical lines, and other utilities are utilized. When all lines have been located, the excavation work area will be rechecked to ensure that no lines have been missed. When lines have been located they shall be exposed by hand before using mechanical excavators;

e. Required PPE shall be used while doing excavation and filling works;

f. Proper warning and instructional signs shall be visibly posted at all times when work is being performed, and shall be removed or recovered promptly after work is completed;

g. Excavation areas shall be properly barricaded, delineated and provided with proper safety and warning signs;

h. Excavation material and heavy equipment shall be kept at a distance as prescribed under OSHS;

i. Gangplanks with railing or metal plates shall be provided where an excavation crosses driveways or streets;

j. Approved access ladder shall be provided and regularly inspected. Ladders shall be extended 3 feet (0.9 meter) above the level to be accessed;

k. Sloping, sheeting, shielding, benching, shoring, cutbacks, fencing, bracing or approved temporary protective structures that may be required for safe operations, are provided for and used, built in accordance with standard engineering practices;

l. Excavation works on identified H_2S prone area shall be inspected for presence of H_2S before any work will commence and regularly monitored during the duration of the work;

m. Temporary railings, barricades, fencing, lanterns, reflective flagging or illuminated warning devices and other warning systems are placed around excavations left open at night or where there is a hazard to Workers and the general public;

n. Spoils, materials or equipment that might fall or roll into an excavation or trench are kept at least 3.3 feet (1 meter) from the edge of excavation, or not less than one-third (1/3) of the depth for excavation deeper than 9.9 feet (3 meters);

o. A Confined Space Entry Permit is prepared and approved to control the work when entry into excavations and trenches deeper than 3.9 feet (1.2 meters) is to be performed;

p. Workers must be protected from accumulation of water, gas and other elements that may be encountered during excavation. Risks associated with hazardous atmosphere inside excavations shall be analyzed and mitigated; and

q. Rescue plans must be developed for excavations. First aid shall be available at all times; Emergency response team shall be available depending on the results of the risk assessment.

2. **Concreting and Structural Works**

a. Work permit system shall cover all structural works at heights and all works that require the use of oxy-acetylene cutting and any kind of welding works;

b. Roles must be clearly defined, and Workers must meet the training requirements for concreting and structural works;

c. Only Authorized Personnel shall supervise all concreting and structural works;

d. Required PPE shall be used while doing concreting and structural works in accordance with Section III.A.2 hereof;

e. Proper warning and instructional signs shall be visibly posted at all times when work is being performed, and shall be removed or recovered promptly after work is completed;

f. Work sites shall be properly barricaded, delineated and provided with proper safety and warning signs;

g. Standard scaffoldings and full body harness shall be provided when working at heights. Installation and dismantling of scaffoldings shall be performed in accordance with DOLE DO No. 128-13;

h. Lifting procedure shall be implemented for heavy and special lifting works. Lifting and rigging procedures shall be in accordance with OSHS; and

i. Rescue plans must be developed for works at height and lifting operations. First aid shall be available at all times; Emergency response team shall be available depending on the results of the risk assessment.

3. **Road Works / Earth Moving**

a. Only Authorized Personnel shall supervise all road works;

b. Roles must be clearly defined, and Workers must meet the training requirements for road works and earth moving;

c. Required PPE shall be used while doing road works in accordance with Section III.A.2 hereof;

d. Proper warning and instructional signs shall be visibly posted at all times when work is being performed, and shall be removed or recovered promptly after work is completed;

e. Traffic management plans shall be in place when work is being done;

f. Workplace conditions shall be inspected to eliminate or control hazards that may expose the Worker to injury;

g. Work sites shall be properly barricaded, delineated and provided with proper safety and warning signs;

h. Only Authorized Personnel shall be allowed to operate equipment;

i. Heavy equipment shall have spotter to assist the operator; and

j. First aid shall be available at all times; Emergency response team shall be available depending on the results of the risk assessment.

4. **Piping and Insulation Works**

a. Only Authorized Personnel shall supervise all piping and insulation works;

b. Only Authorized Personnel shall be allowed to conduct piping and insulation works;

c. Required PPE shall be used while doing piping and insulation works in accordance with Section III.A.2 hereof;

d. Proper warning and instructional signs shall be visibly posted at all times when work is being performed, and shall be removed or recovered promptly after work is completed;

e. Workplace conditions shall be inspected to eliminate or control hazards that may expose the Worker to injury;

f. Work sites shall be properly barricaded, delineated and provided with proper safety and warning signs;

g. All coded piping and insulation works (i.e., high pressure pipe welding, hot tapping) shall have detailed and approved safe work procedures;

h. All piping and insulation works shall be covered with appropriate work permit system;

i. All coded piping and insulation work wastes shall be properly disposed according to environmental regulations; and

j. First aid shall be available at all times; Emergency response team shall be available depending on the results of the risk assessment.

5. **Hot Works**

a. The Employer shall establish a program which designates who issues a hot works permit and what kind of jobs are covered by a hot works permit;

b. Only Authorized Personnel shall supervise all hot works;

c. Only Authorized Personnel shall be allowed to conduct hot work;

d. Required PPE shall be used while doing hot works in accordance with Section III.A.2 hereof;

e. Proper warning and instructional signs shall be visibly posted at all times when work is being performed, and shall be removed or recovered promptly after work is completed;

f. Workplace conditions shall be inspected to eliminate or control hazards that may expose the worker to injury and potential property damage;

g. All hot works shall have detailed and approved safe work procedures;

h. All hot works shall be covered with appropriate work permit system;

i. Combustible and flammable materials shall be removed from the work area;

j. Items that cannot be removed shall be covered with fire-retardant blankets;

k. In areas where no works are performed, the floors should be kept clean;

l. Welding shields should be provided to contain or protect from sparks and splatters;

m. A Fire Watch with appropriate communication and fire extinguishing equipment shall be assigned whenever hot work is performed in locations where other than a minor fire might develop;

n. The hot work area shall be gas tested by an Authorized Personnel if the area is known to have potential presence of flammable gas or liquid using approved and calibrated gas detection instruments. Atmospheric conditions in the work area must be acceptable before any work is allowed to start or continue. Flammable atmosphere should be less than 10% of the LEL; and

o. First aid shall be available at all times; Emergency response team shall be available depending on the results of the risk assessment.

6. **Mechanical and Equipment Installation**

a. Mechanical Engineers shall supervise over all mechanical equipment installation as per Article IV, Section 33 and 35 of RA No. 8495;

b. Observe the personnel requirement under Section 34 of RA No. 8495;

c. Mechanical equipment covered by DOLE technical safety inspection shall secure the needed permit to install before installation and permit to operate before operation;

d. Roles must be clearly defined, and Worker must meet the training requirements for mechanical and equipment installation;

e. Required PPE shall be used while doing mechanical and equipment installation in accordance with Section III.A.2 hereof;

f. Proper warning and instructional signs shall be visibly posted at all times when work is being performed, and shall be removed or recovered promptly after work is completed;

g. Workplace conditions shall be inspected to eliminate or control hazards that may expose the worker to injury;

h. All mechanical and equipment installation shall have detailed and approved safe work procedures;

i. All mechanical and equipment installation shall be covered with appropriate work permit system;

j. All mechanical and equipment installation work wastes shall be properly disposed according to environmental regulations;

k. Appropriate lifting equipment and procedures shall be used in mechanical installation; and

l. First aid shall be available at all times; Emergency response team shall be available depending on the results of the risk assessment.

T. Motor Vehicle and Heavy Equipment Operations

1. Only Authorized Personnel shall supervise all motor vehicles and heavy equipment operations;

2. Only Authorized Personnel shall be allowed to operate motor vehicles and heavy equipment;

3. Drivers and heavy equipment operators shall have valid driving license and mandatory government certifications appropriate for the equipment they will operate;

4. Drivers/operators under the influence of liquor and/or asleep inducing drugs or any medication that will affect vision, judgment and reflexes shall not be allowed to operate motor vehicles and heavy equipment;

5. All motor vehicles and heavy equipment shall be:

a. Provided with basic emergency tools and equipment like early warning device, choke block, fire extinguisher etc.;
b. Subjected to a pre-use inspection;
c. Loaded up to its rated capacity only; and
d. Subjected to scheduled preventive maintenance;

6. All drivers/operators shall immediately report any observed unsafe condition of the motor vehicles and heavy equipment;

7. All drivers/operators shall strictly follow all established company and government traffic rules and regulations;

8. All vehicles and heavy equipment deemed or reported to be unsafe shall be removed immediately from service and shall not be used until appropriate repair has been undertaken;

9. All drivers shall report immediately any vehicular incident to the company and appropriate authorities;

10. All motor vehicles and heavy equipment shall be equipped with the prescribed and approved seat belts for all driver and passenger seats;

11. Only Authorized Personnel shall conduct repairs to all motor vehicles and heavy equipment;

12. Any vehicle with restricted vision shall not be moved while in the vicinity of other workers, processing equipment or servicing/drilling equipment except under the direction of a designated signal man or spotter; and
13. A Journey Management Plan shall always be prepared for non-routine trips and journeys with high risks (i.e., oversized cargoes, unpaved roads, roads with dangerous curves) to ensure that driving risks and exposures are minimized and managed.

U. Hoist and Lifting Works Operations

1. Only Authorized Personnel shall supervise hoist and lifting works;

2. Only Authorized Personnel shall be allowed to operate hoist and lifting equipment;

3. Only authorized rigger shall be allowed to direct and guide hoist and lifting operation;

4. Operators under the influence of liquor and/or asleep inducing drugs or any medication that will affect vision, judgment and reflexes shall not be allowed to operate hoist and lifting equipment;

5. All hoist and lifting equipment shall conform to the requirements of all applicable industry and regulatory standards;

6. All hoist and lifting equipment shall be provided with basic emergency tools and equipment where applicable like horn, lights, outrigger matting, fire extinguisher etc.;

7. All hoist and lifting equipment shall be subjected to a pre-use inspection by authorized operator for safe operation;

8. All hoist and lifting equipment shall be loaded up to its rated capacity only;

9. All hoist and lifting equipment shall be subjected to scheduled preventive maintenance in accordance with manufacturer's recommendations;

10. Worker/s shall immediately report any observed unsafe condition of the hoist and lifting equipment;

11. All unsafe hoist and lifting equipment shall be removed immediately from service and shall not be used until appropriate repair has been undertaken;

12. Worker/s shall report immediately any incident/accident to the company and appropriate authorities;

13. All hoist and lifting equipment shall be equipped with the prescribed and approved seat belts;

14. A daily routine inspection of all heavy equipment deployed at the site shall be conducted by Authorized Personnel and certified mechanics shall conduct repairs of the hoist and lifting equipment;

15. All heavy equipment shall be regularly inspected and maintained in good condition;

16. All hoist and lifting equipment shall be subjected to load test inspection as recommended by the manufacturer and as prescribed by DOLE or its recognized organizations;

17. All critical lift works or jobs shall be covered by critical lift procedure;

18. The general constructor or the equipment owner shall maintain a separate logbook for data on maintenance, repairs, tests and inspections for each heavy equipment;

19. Prior to performing a lift, the operator shall determine the weight of the object to be lifted and ensure that cables, lifting devices, slings, wire ropes, chains, etc. are of sufficient strength, in proper condition, and positioned to support the weight of the load. Load calculations shall be conducted for all critical lifts;

20. The following should always be considered:

    a. Proximity to power lines;
    b. Proximity to other Worker and equipment;
    c. Wind velocity;
    d. Ground conditions for outriggers;

e. Reach or extension of lifting equipment;
f. Weight of the load including the rigging being used; and
g. Outriggers placed on load bearing floats or pads that are adequate size and strength for loads being lifted;

21. One person shall be designated as a spotter (signal person or flagman) and the lifting device operator shall take direction or instruction from the spotter only;

22. The operating area of the lifting device shall be barricaded and no Worker shall allow any part of his body to extend underneath any load being lifted by a crane, side boom, or other lifting device; and

23. No person shall be allowed to work, walk through, stand, or stay beneath any suspended load being lifted, moved or lowered.

V. Working at Height and Protection from Falling Objects

1. Ensure all structures are designed and built to the appropriate standards and have the appropriate means of working at height systems fitted;

2. Establish and maintain suitable exclusion zones underneath any working at height activities, where possible, to protect workers from falling objects;

3. Ensure all Workers working at height are trained and competent in the use of all working at height and rescue systems in place;

4. Provide Workers with a suitable work-positioning device; also ensure the connectors on positioning systems are compatible with the tower components to which they are attached;

5. Ensure that hoisting equipment is properly rated and maintained and that hoist operators are properly trained;

6. When working at height, fit all tools and equipment with a lanyard, where possible, and capture netting should be used if practicable;

7. Remove signs and other obstructions from poles or structures prior to undertaking work;

8. Use an approved tool bag for raising or lowering tools or materials to workers on elevated structures;

9. Avoid conducting tower installation or maintenance work during poor weather conditions and especially where there is a risk of lightning strikes;

10. Place an emergency plan detailing the methods to be used to rescue operatives should they become stranded or incapacitated while at height; and

11. Use required PPE while working at height and protection from falling objects in accordance with Section III.A.2 hereof.

W. Fire Hazards, Protection and Control

1. General Objective

All wind operators shall establish a fire prevention and control program in accordance to Republic Act No. 9514 also known as the "*Fire Code of the Philippines of 2008*".

2. Fire Extinguishers

a. Fire extinguishers shall be inspected once a month and shall be maintained in good operating condition at all times;

b. Fire extinguishers shall be kept in their designated places. If they are removed for refilling/repair, it shall be replaced immediately with the same type and capacity;

c. Durable inspection tags shall be attached securely to each extinguisher showing the servicing data properly recorded and signed by the designated safety officer or end-user;

d. Fire extinguishers shall be installed in strategic locations free from obstructions. Only fire extinguishers shall be placed inside the extinguisher box to avoid exposure to excessive heat;

e. Tampering of markings, tags and other emergency instructions labeled on all fire protection equipment shall be prohibited;

f. Fire extinguishers shall have hydro testing records according to manufacturer's specifications; and

g. Fire extinguishers shall conform to the fire protection standard as per Fire Code of the Philippines and DAO 2000-18 also known as the Chemical Control Order for Ozone Depleting Substances (ODS) and other related rules.

3. Fire Hydrants, Fire Hoses and Accessories

a. Fire hydrants, hoses and accessories shall conform to the Fire Code of the Philippines;

b. Fire hydrants, hoses and accessories shall be kept in good condition. They shall be used properly and only for the purpose for which they are intended;

c. Fire hose installed at yard hydrant shall be kept in well-ventilated fire hose cabinet properly locked and marked "FOR FIRE USE ONLY;"

d. Only Authorized Personnel shall conduct inspection and/or testing of fire hydrants, hoses and accessories at least once a month. Defective items shall be replaced immediately;

e. Firefighting equipment shall be placed in strategic locations and must be free from obstructions; and

f. Tampering of fire alarms, valves and other accessories is prohibited. Any damaged parts should be immediately repaired or replaced.

4. Firebreak

a. Firebreaks should be of sufficient length and width to contain a possible fire and allow passage of firefighting vehicle; and

b. Erosion control measures must be incorporated into firebreaks with sloping ground.

X. Scaffolding Safety

Scaffoldings requirements shall be in accordance with DOLE DO No. 128-13.

1. General Requirements

a. Installation, dismantling and structural requirements of scaffolding shall conform to the requirements of all applicable industry and regulatory scaffolding standards;

b. Every scaffold shall be of good construction of sound materials and strength for the purpose for which it is intended;

c. Timber used for scaffolds shall be in good condition, the bark completely stripped off, and not painted or treated in any manner that defects cannot be easily seen;

d. All materials and parts of scaffold not in use or intended for re-use shall be kept under good condition and separate from other materials unsuitable for scaffolds;

e. Scaffolds shall be erected, moved, dismantled, or altered only under the supervision and direction of a qualified scaffolder;

f. Scaffolds and scaffold components shall be capable of supporting, without failure, its own weight and at least 4 times the maximum intended load;

g. Scaffold products from different manufactures shall not be mixed on a scaffold, unless they are specifically designed to be used together;

h. A scaffold should never be erected within 10 feet (3 meters) of power lines;

i. It is prohibited to ride on a moving mobile scaffold;

j. Guardrails, midrails, and toeboards shall be installed on all open sides and ends of platforms 6 feet (1.8 meters) above the working surface (floor);

k. Guardrails shall be 2" X 4" or the equivalent (2" nominal diameter for tubular scaffolds) approximately 42 inches (106.7 cm) in ht. with a midrail. Supports shall be at intervals not to exceed 8 feet (2.4 meters);

l. Toeboards shall be of 4 inches (10.2 cm) in height;

m. Scaffold planks shall extend over their end supports not less than 6 inches nor more than 12 inches (30.5 cm);

n. Any scaffold including accessories such as braces, brackets, trusses, screw legs, ladders, etc. damaged or weakened from any cause shall be immediately repaired or replaced;

o. Timber planking is allowed for the scaffold and shall have a minimum of 1,500 fiber (stress grade) construction grade lumber;

p. Scaffolding will be inspected for safe conditions on a daily basis. The contractor responsible will maintain a daily inspection permit and must conform to the requirements on the project site;

q. Scaffold must be tagged by a competent person. This inspection tag shall be attached on the scaffold at all times. Scaffold identification tags are color coded for each reference and should be located at the point of access;

r. All Workers using a rolling scaffold must engage the wheel locking devices or block the scaffold against movement when the scaffold is stationary and Workers are working from the scaffold. Moving scaffolding with Worker on the scaffold is strictly prohibited;

s. Tools and equipment shall be raised to the work site in a bag or utility belt designed for that purpose. Straight access ladder attached to scaffolding should not exceed 20 feet (6.1 meters) without a break or offset that would limit a potential fall exposure. Access ladder that exceed 20 feet (6.1 meters) from the ground level should be placed inside the scaffolds frame with trap door conditions at access levels;

t. Ladders shall not be used on scaffolds to increase the working level height of workers, except on large area scaffolds where workers have satisfied some reasonable criteria;

u. Makeshift devices, such as but not limited to boxes and barrels, shall not be use on top of scaffold platforms to increase the working level height of Workers;

v. Scaffold tower, single-section, or rolling scaffolds must not exceed a 4:1 base-to-height ratio without structural bracing. Nor shall any section of the scaffold exceed a 4:1 ratio without structural bracing;

w. Cantilevered or outrigger scaffolds must have documentation to demonstrate safe loading conditions;

x. All suspended scaffolds require independent safety lines for each worker. Workers must use a full body harness when working from any suspended scaffold. Personal fall arrest system used on scaffolds shall be attached by a lanyard to a vertical lifeline, horizontal lifeline, or scaffold structural member;

y. Personal fall arrest system/Safety harnesses meeting an approved standard must be worn. Only full body safety harnesses (i.e., with chest and leg straps) will be permitted; and

z. Overhead work should not be carried out above other workers unless the workers below are adequately protected by the installation of an overhead barrier. Every area where a worker could be struck by a falling object shall be clearly marked by barriers, notices, warning lights or other warning devices.

2. Scaffolding Components and Requirements

a. Materials

i. Materials to be used in erecting scaffolding should be in good condition;
ii. Steel items should be free from rust; and
iii. Mandatory inspection should be conducted by experienced and competent person to all materials before use;

b. Foundation

i. Scaffold shall be capable of supporting without failure at least 4 times the maximum intended load;

ii. Timber sills at least 23 cm (9.1 in.) wide by 3.8 cm (15 in.) thick will be required to spread the load. A sill shall extend under at least two post;
iii. Where scaffolding is erected on a solid bearing such as rock or concrete, small timber pads may be used in place of sills and nailed to prevent the base plates sliding off;

iv. If used to compensate variations in ground levels, the screw jacks shall not be adjusted more than two-thirds of the total length of the thread;

v. Scaffolds shall be anchored or secured to permanent or rigid structures. In the absence of permanent structures, guys and sway bracing and/or outrigger shall be used; and

vi. The foot of any standards or upright should be adequately founded on a suitable base plate in order to prevent slipping or sinking;

c. Posts

i. Posts shall be pitched on 6 inches (15 cm) by 6 inches (15 cm) steel and at least 0.25 inch (0.64 cm) thick. All post shall be vertical; and

ii. The inner row posts shall be placed as closed as possible to the face of the building structure. The outer row shall be positioned depending on the load requirements of the scaffold;

d. Runners

i. Runners shall be securely fixed to post with standard couplers and shall be horizontal; and

ii. Runners shall be vertically spaced no more than 6.5 feet (2.0 meters) to give adequate headroom along the platform;

e. Bearers

i. Bearers should be installed between post and securely fixed to the post with standard couplers; and

ii. Board bearers shall be installed between bearers to accommodate differences in planks length;

f. Bracing

i. Longitudinal diagonal bracing shall be installed at approximately 45° angle from near the base of the first outer post upward to the extreme top of the scaffold;

g. Ties

i. All supported scaffolds except tower and mobile shall be securely tied to a building or structure throughout their length and height to prevent movement of the scaffold;

ii. Ties should be spaced every other lift and every 19.6 feet (6 meters) along the face of the scaffold;

iii. Ties should be fixed with load bearing couplers, as close to the node point as possible;

iv. Any structural features of the buildings e.g. pillars, columns, lintels, rebates, etc. should be taken full advantage to provide additional strength and stability to the tie;

v. Make sure that the building is strong enough to support the tie and the load imposed on it by the scaffold; and

vi. For any reason, tie should not be removed until the overall stability of the scaffold has been confirmed;

h. Platform Units

i. All platform units shall be closed planked for the full width of the scaffold structure;

ii. Planks shall be extended over their end supports by not less than 6 inches (15 cm) and not more than 12 inches (30.5 cm);

iii. Planks shall be secured in position to prevent displacement by strong winds;

iv. Mid rails must be installed halfway between the top rail and platform and can withstand force of 150 lbs.; and

v. Toe boards shall not be less than 4 inches (10 cm.) in height by 1 inch (2.5 cm) thick;

i. Access

i. Access to a working platform is best achieved by providing a separate ladder tower or a cantilevered access platform so as not to obstruct the working platform and to minimize the risk of persons falling through gaps in the guardrail system or platform units. Access should be provided to working platforms; and

ii. Working platform shall be provided per level during erection. This working platform shall not be removed unless the succeeding level is installed;

j. Workmanship

i. Scaffolding shall be erected, altered and dismantled by experienced men working under the direction of a competent supervisor; and

ii. Scaffolds of more than 19.6 feet (6 meters) in height shall be designed by a structural engineer and shall be erected, installed and dismantled by TESDA certified erectors; and

k. Inspection

i. All scaffolds shall be inspected by a competent supervisor, safety officers, and/or civil engineers before it is used and after adjustments, modifications, adverse weather conditions, etc., to measure that is safe:

i.i **Green** tags shall be hanged at each scaffolds access that have been inspected and are safe for use;

i.ii **Yellow** tags shall be placed whenever special requirements for safe use are required. Situation requiring yellow tags may include whenever scaffold has been modified to meet work

requirements, and as a result could present a hazard to the user. Situation requiring Yellow tags shall be closely supervised; and

i.iii **Red "DANGER – UNSAFE FOR USE"** tags shall be used during erection and dismantling when the scaffold is left unattended. Red tag shall be used when all green or yellow tags has been removed or during erection of scaffolds; and

ii. All the records of the inspection shall be available on site and made available to proper authority upon request.

3. **Training and Competency Requirement**

a. Competent Person

i. All scaffolds competent person must undergo the standard scaffold training and assessment prescribed by DOLE and TESDA; and

ii. The competent person shall have the following certification:
ii.i COSH Training Certificate from DOLE or its accredited safety training organizations;

ii.ii Must be a holder of TESDA prescribed Scaffold Erection Certificate; and

ii.iii At least 2 years' experience in scaffold erection;

b. Scaffold Erector

i. All scaffolds erectors must undergo the standard scaffold training and assessment prescribed by DOLE and TESDA;

ii. Scaffold erectors shall have the following certifications:
ii.i One Day Workers Safety Organization from DOLE or its accredited safety training organizations; and
ii.ii. Must be a holder of TESDA prescribed Scaffold Erection National Certificate.

Y. Machine Shop Safety

1. Allow only Authorized Personnel to use the machine shop;

2. Use required and appropriate PPE while working in the shop in accordance with Section III.A.2 hereof;

3. Observe the "buddy system" while working in the shop;

4. No eating, drinking and smoking inside the machine shop area;

5. Keep the work area clean and always keep the floor free of grease, oil or any other liquids;

6. Do not allow horseplay and/or running in the machine shop;

7. Do not wear loose jewelry and clothing including long sleeves and ties in the shop;

8. Tie back long hair while working in the shop;

9. Seek for your co-worker's assistance in handling large, long, or heavy pieces of material or machine attachments;

10. Report any unsafe acts and conditions to the shop supervisor and/or safety officer;

11. Always make eyewash and first aid kit station available in a designated place; and

12. Post the machines user's guide and/or safety manuals in a strategic location for easy reference.

Z. Tools, Equipment and Machinery Operations

1. Workers must only work with tools, equipment and machines that they have been authorized to use;

2. Appropriate tools, equipment and machines shall be used on a specific job;

3. Each tools, equipment and machines must be examined before use. Damaged tools, equipment and machines should be reported to proper authorities;

4. Damaged tools, equipment and machines must be repaired before using it;

5. All tools, equipment and machines necessary to complete the task must be kept in good condition with regular maintenance;

6. Tools, equipment and machines must be operated according to the manufacturers' instructions;

7. All tools and equipment should be kept cleaned and stored appropriately when not in use;

8. All portable electrically-driven tools, equipment and machines shall be properly grounded before use;

9. Iron or steel hand tools may produce sparks that can be an ignition source around flammable substances. Where this hazard exists, spark-resistant tools made of non-ferrous materials should be used where flammable gases, highly volatile liquids, and other explosive substances are stored or used;

10. Air supply shall be shut off when pneumatic tools, equipment and machines are not in use;

11. Pointed or sharp tools, equipment and machines shall be provided with cover;

12. Talking to others while they are operating a machine is prohibited;

13. Tools should not be left unattended. They should be placed in the designated toolboxes or cabinets after using them;

14. A machine should not be left unattended while it is running;

15. Only one person may work on a machine at a time;

16. When working with another person, only one should operate the machine or switches;

17. A cutter should not be used by pushing it towards your body parts;

18. Work piece must always be secured with a clamp or vise;

19. Compressed air should not be used without a safety nozzle to clean the machines. Compressed air should never be used to clean clothing;

20. Metal chips, turnings or shavings should not be removed with your hands;

21. Tools should be disconnected when not using them, before servicing and cleaning them, and when changing accessories such as blades, bits, and cutters;

22. Proper apparel for the task should be worn. Loose clothing, ties, necklaces, or jewelry can become caught in moving parts;

23. Electrical hand tools shall not be used in a combustible environment until the Supervisor certifies that conditions are safe and a Hot Work Permit has been issued; and

24. The tools, equipment and machines user's guide and/or safety manuals should always be followed.

AA. Machine Guarding

All moving parts of prime movers, transmission equipment and all dangerous parts of driven machinery shall be effectively guarded, unless so constructed or located to prevent any person or object from coming or brought into contact with them;

1. No person shall remove or make ineffective any safeguard, safety appliance, or safety device guarding a dangerous machine or machine part unless such is authorized and the machine is stopped for the purpose of immediately repairing and adjusting such machinery, guard, appliance or device;

2. Warning signs with standard color shall be installed near the machine being repaired or its guards removed;

3. Upon completion of the repairs or adjustment, such guards, appliances or devices shall immediately be reinstalled before the machine is used;

4. Guards shall be designed, constructed and used that they will:
   a. Provide positive protection;
   b. Prevent all access to the danger zone during operations;
   c. Cause no unnecessarily or inconvenience operation or production;
   d. Operates automatically or with minimum effort;
   e. Be suitable for the job and the machine;
   f. Cause no obstruction or interfere with machine oiling, inspection, adjustment and repair;
   g. Withstand long use with minimum maintenance;
   h. Resist normal wear and shock;
   i. Be durable, fire and erosion resistant;
   j. Not constitute a hazard by themselves; and
   k. Give protection against operational contingencies and not merely protect normally expected hazard;

5. Standard guards or enclosures shall be made of materials suitable for the purpose for which they are designed and constructed; and

6. All machinery guards shall be securely fastened to the machine or to the floor, wall or ceiling and shall be kept in place whenever the machine is in operation.

BB. Biological Safety

1. General Requirements

a. All field activities/works shall be covered with appropriate work permit system;

b. Required PPE shall be used while doing field activities such as long pants, long-sleeves shirts, shin guards, heavy high top shoes or hiking boots to cover exposed body parts and provide some protection and use walking sticks; and

c. Workers training should always include information on safe methods and prevention for highly hazardous procedures that are commonly encountered during outdoor field work.

2. Workplace Inherent Biological Hazards

a. To avoid bees and wasp stings:

   i. Avoid known areas of concentration such as hives and nests;
   ii. If flying insects are around, leave the area and refrain from swatting at them;
   iii. Avoid sugary foods, drinks, and strong fragrances or perfumes because some insects may be attracted to them;
   iv. Wear long pants, and long-sleeves shirts;
   v. Wear heavy high top shoes or boots, protective gloves, and use walking sticks; and

vi. If stung by bees or wasp, seek immediate medical attention.

b. To avoid snake bite:

i. Always ask about snakes from local residents and employ local resident as a guide;
ii. When walking, keep your eyes on your path and avoid stepping into clumps of vegetation;
iii. Do not step over logs or large rocks if you cannot see over them;
iv. Wear long pants and long-sleeves shirts;
v. Wear heavy high top shoes or boots, protective gloves, and use walking sticks;
vi. Do not kill non-poisonous snakes, they keep the food supply low and keep the population of poisonous snakes down;
vii. Never pick up an apparently dead snake with your bare hands. Even severed snake head can inflict a deadly bite for 15 - 30 minutes after separation from the body. Should it be necessary to move the dead snake, use a stick; and
viii. If bitten, seek medical assistance at the nearest clinic or hospital, vials or antivenin shall be approved and supplied by the Research Institute for Tropical Medicine (RITM).

c. To avoid leeches:

i. Wear long pants and long-sleeves shirts;
ii. Wear heavy high top shoes or boots, protective gloves, and use walking sticks; and
iii. During rest, find a spot with direct sunlight, leeches do not exist in dry and hot places.

CC. Geohazards Requirements

a. The Employer shall establish a geohazard assessment team and mandate;

b. The team shall identify the presence of geohazards within the contract area and/or nearby vicinities, thru the inventory of landslides, flooding, and rock fall prone areas;

c. The Employer shall initiate mitigating engineering and administrative measures and formulate emergency/contingency plans;

d. The team shall meet annually or as the need arises;

e. All Workers and the communities shall be properly informed of the major geohazards, thru posting of illustrations in the form of schematics (i.e., maps, posters, signages and drawings) in public places; and

f. In the occurrence of geohazard events such as landslides, earthquakes and flooding, the Disaster Emergency Preparedness/Contingency Plan and Response Team shall be deployed to the concerned area.

DD. Pets and Stray Animals

a. All safety measures shall be considered in preventing stray animals from causing hazard to facility and Workers but with regard to law on animal rights and environmental conservation efforts;

b. Fences/nets shall be installed where appropriate/feasible;

c. Do not feed, touch or adopt wild animals and be cautious around stray cats and dogs;

d. Workers shall leave wildlife alone and ensure that they do not allow themselves to be bitten or scratched by them;

e. Domestic pets such as cats, dogs, birds, etc. shall not be allowed but if really needed (such as guard dogs), they shall be vaccinated for rabies and the vaccinations shall be kept current;

f. Keep trash can lid secure since open containers can attract wildlife;

g. Any bite incidents shall be reported to the local health department and consult doctor for medical advice and treatment; and

h. Fuse boxes and other electrical parts with open wires (no insulation) shall be sealed to prevent animals (particularly rats and snakes) from short-circuiting the system.

EE. Security Equipment

a. Security equipment such as cameras and motion sensors in vantage points can be installed and utilized to help deter or thwart unauthorized access and break-ins as well as track the movement of Worker and equipment to ensure safe operations and maintenance.

Section IV. Power Plant Facilities

A. Power Plant Safety

1. All Workers shall be qualified and trained in their respective job assignments;

2. All Workers shall undergo occupational safety and health orientation and training;

3. All Workers shall immediately report any observed unsafe condition, incident and accident in accordance with the established company safety reporting procedures and guidelines;

4. All Workers shall be required to wear appropriate and prescribed PPE in accordance with Section III.A.2 hereof;

5. Only Authorized Personnel shall conduct repairs and calibration to any plant equipment and instruments;

6. All power plants shall establish work procedures for:

   i. Start-up and Shut-down;
   ii. Emergency;
   iii. Normal and Abnormal Operation; and
   iv. Operation and Maintenance Work for Electrical, mechanical, Instrumentation and communication equipment.

Such procedures shall include hazard identification, analysis, mitigation and emergency response; and

7. All works shall be covered with appropriate work permit system.

B. Control Room Safety

1. Only Authorized Personnel are allowed to manipulate control panel knobs, buttons, and switches. Bystanders are not allowed inside the control room unless authorized;

2. Air conditioning unit should be kept running twenty-four (24) hours a day to maintain the control room temperature and to keep the air clean and filtered;

3. The door of control rooms should always be closed to reduce outside air infiltration/cooling loads and H_2S contamination;

4. Control rooms are "NO SMOKING" areas and such policy shall be observed at all times;

5. LOTOTO procedure and proper clearance from the authority shall be strictly complied with;

6. Automatic/emergency lighting system shall be provided at all access and means of egress;

7. The door of circuit breaker/panel should always be kept closed;

8. Control and power meter panel shall have safety floor markings; and

9. Emergency button of the control panel shall have interlock and cover to prevent accidental operation and would cause force shutdown of the power plant.

C. UPS and Battery Bank Room Requirements

1. Only Authorized Personnel are allowed to enter the room;

2. Air conditioning unit must be operated twenty-four (24) hours a day at temperature not greater than 15°C for electronic equipment cooling;

3. The door of UPS and battery bank room should always be closed to reduce outside air infiltration/cooling loads and H_2S contamination;

4. Battery bank should be kept free from leaking solutions;

5. Battery room should not be used as dressing room;

6. The exhaust ventilation must be placed in accordance to PSME Code. A spare fan should be readily available;

7. The direct current (DC) system shall be readily available whenever the DC power is interrupted to the system;

8. Eyewash station must be provided near the battery room;

9. Check-up of battery electrolyte leak and specific gravity should be done regularly; and

10. Proper handling, storage, and disposal of unserviceable batteries should be observed in compliance with regulatory requirements.

D. Equipment Repair and Troubleshooting in Electrical Power Facilities

1. Never attempt to execute troubleshooting and repair of any line conductors and electrical equipment and circuitry at control panel board without permission and proper coordination with area supervisor;

2. Always wear electrically rated safety shoes when performing troubleshooting and repair of any faulty line conductors encased in metallic cable tray;

3. Place warning tags (indicating reasons for isolation) on any circuit cut-out/breakers with the requested "DE-ENERGIZE" line associated;

4. Insulate all dangling and bare terminals of power conductors right after disconnection;

5. De-energize all power line conductors and use voltage detector to ensure the line is safe, when troubleshooting and repairing all electrical works;

6. Ensure all electrical tools/equipment used are properly insulated and must be capable to handle the voltage of the work piece;

7. Conduct insulation resistance testing on any line conductors and equipment being repaired and/or replaced prior to re-energization to determine the di-electric strength of the insulation; and

8. Advise superior immediately any faults, tripping or hazards observed on any electrical equipment or installation.

SECTION V. Wind Energy Operations

A. Wind Energy Operation Requirements

All wind energy operations shall comply with the following minimum requirements:

a. Standard Operating Procedure;
b. Orientation/Training;
c. Work Permit System;
d. Close Supervision of Authorized Personnel;
e. Monitoring Tools/Instruments;
f. Communication Tools/Equipment;
g. Emergency Preparedness and Disaster Management Plan; and
h. Personal Protective Equipment.

B. Pre-Development Stage/Exploration Stage

1. General Requirements

a. Make sure that only Authorized Personnel shall supervise and conduct on-site wind resource assessment activities;

b. Designate a safety officer, who is duly registered with the DOE, during the entire conduct of on-site wind resource assessment;

c. Always implement the use of "buddy system";

d. Make sure that all devices, tools, and equipment shall be used, handled, installed, maintained, calibrated and stored only by an Authorized Personnel;

e. Conduct geohazards and structural assessment prior to pre-development/exploration activities;

f. Conduct daily safety meetings to review the project's progress and status, personnel deployment locations, equipment layout and the Worker's condition;

g. Check the condition of the service vehicle, communication tools and appropriate PPE;

h. Coordinate with local authorities for security purpose before starting pre-development/exploration activities;

i. Install and maintain meteorological stations and its equipment to be free or to minimize electrical, mechanical, and environmental hazards;

j. Record and protect all data from damage or loss;

k. All meteorological stations shall follow proper grounding and lightning protection in accordance to the Philippine Electrical Code; and

l. Prior to assessment/exploration, a designated member/s of the exploration team accompanied by local resident shall scout and assess the exploration area for accessibility in advance, prior to the entry of the main exploration team to avoid geohazards and biological hazards.

2. Composition of a Wind Exploration Team

a. One team leader who shall provide guidance, instruction, direction and leadership to the exploration team.

b. One or more member/s, who may be an engineer, geologist or field technician with expertise in wind resource assessment and development;

c. One lead guide, knowledgeable with various terrains, elevated structures, and bodies of water;

d. One team member who shall function as sweeper;

e. Safety Officer; and

f. Helpers, if necessary.

3. Dealing with Various Kinds of Terrain

a. Under the responsibility of the lead guide, confirm the accessibility of the area before entering or passing through it;

b. For passable terrains, check for falling debris, sharp objects and maintain a distance of two (2) meters in between individuals;

c. For terrains passable only with the aid of rope, setup the rope on a secured anchor and pass one at a time with caution; and

d. Look for alternative route for impassable terrains, such as areas with loose ground and/or nothing to hold to, traps, and aggressive animals.

4. Dealing with Bodies of Water

The team shall consider the various types of bodies of water when traversing or crossing through it:

a. For calm and mid to shallow bodies of water, the lead guide shall assess the slippery areas and sudden changes in water depth, aided by a stick. Then, the team shall thereafter pass one or two at a time aided by the guide;

b. For raging mid to shallow bodies of water, the lead guide shall check for rock boulders as path. As additional precautionary measure, the lead guide shall check the presence of slippery areas and proceed with caution. If none, the lead guide shall tie and secure the rope, in a position

oblique to the flow. The team shall pass one at a time aided by the guide, holding tightly on the rope; and

c. For deep but calm and/or raging bodies of water, the team shall re-strategize to a safer method of crossing using various means of water transport (e.g., banca, canoe, balsa, etc.) or re-route to a safer path.

5. Camp Safety

a. In selecting camp location, the following shall be considered:

i. Camp location shall be at least 10 meters away from bodies of water;
ii. The camp area shall be clear from sharp rocks, glass shards and poisonous plants;
iii. The camp area shall be slightly sloping to ensure water drainage;
iv. The camp area shall have a protection from strong winds;
v. The camp shall not be set up too close to the water source to be considered safe from wild animals;
vi. Cooking shall be done far from the tents (~10m away) to avoid inviting aroma to wild animals; and
vii. Food and other aromatic materials shall be stored outside the tents. If possible, hang the items at a height not reachable by animals.

b. Other safety protocol:

i. Insect repellent should be applied, as deemed necessary;
ii. The buddy system shall be implemented continuously, whereby measures ensuring that the location of one buddy is always be known by the other are in place;
iii. Camp fires are discouraged. However, if such is absolutely needed, the team must ensure that camp fires are properly put out before the campers go to sleep;
iv. During night time, at least two (2) persons shall be assigned as look out on a routine basis to oversee the safety and security of the camp site;
v. Alcoholic beverages are prohibited during camping; and
vi. If possible, consuming and/or damaging local fauna and flora should be avoided.

6. Outcrop Observation

a. For data collection:

i. In observing the outcrop from afar, one shall position himself on stable ground, visible to the team members; and
ii. In measuring structural orientations, the following must be done:
    1. The team should be aware of falling debris and unstable areas prior to getting near the outcrop; and
    2. The lead guide shall clear the outcrop from plant hazards and unconsolidated debris.

b. For soil & rock sampling:

i. Field test equipment/instruments should be properly selected and operation and calibration should also be checked, as required, in accordance with procedures and manufacturer/fabricator's instructions to ensure safe operation and valid results;
ii. All sampling equipment, field test equipment, materials, containers and safety equipment should be assembled and checked;
iii. The team shall wear proper PPE prior to hammering;
iv. Other team members should also wear goggles. Otherwise, they should position far from the point to be sampled;
v. Prior to hammering, the geologist or sampler shall ensure that no limb is situated immediately below the rock hang;
vi. For large rock fragments intended to be broken into pieces, the sampler must practice hammering with rock stabilized only by foot (standard geology practice);
vii. The edges of the rock sample should be smoothened prior to placing them on the sample bags;
viii. Filled sample bags shall be placed in a heavy duty sack or bag;
ix. All hazardous wastes for appropriate disposal should be ensured to have safely collected; and
x. Handling and storing hazardous materials and equipment should be made in accordance with labels and Material Safety and Data Sheet.

C. Development Stage

1. General Requirements

a. Only Authorized Personnel shall be allowed to undertake development activities including the operation and maintenance of wind facilities, structures, appurtenances and equipment; and

b. The Employer shall designate a safety officer, which is duly registered with the DOE, during the development stage of the wind project;

2. Inspection

a. Routine inspection shall be done to check and identify if there are any deficiencies, troubles or problems in wind facilities, structures, appurtenances and equipment so as to reasonably assure safe operation as well as confirm that maintenance is being adequately performed;

b. Inspection shall be performed immediately after any unusual event such as large floods, earthquakes, sabotage and other natural calamities;

c. Inspection results shall be properly evaluated and the corresponding action plans, as deemed applicable, shall be developed and implemented; and

d. The conduct of inspection including the result and action plan shall be recorded, documented and monitored accordingly.

3. Operation and Maintenance Manual

Operation and maintenance manuals containing pertinent design and construction information on wind facilities, structures, appurtenances and equipment shall be kept current, and records shall be maintained of instructions, inspections and testing. Status of repair/rehabilitation, action plan and any related corrective action whether implemented, planned, ongoing or continuing shall be properly documented and monitored.

4. Wind Operation Activities, Infrastructures, Components and Proximities

a. Transportation of Components

i. Important factors to consider when transporting wind turbine components includes:
   1. provisions of escorts;
   2. contingency planning;
   3. identification and avoidance of restricted access routes;
   4. steep gradients;
   5. confined road corridors;
   6. road traction;
   7. limited turning points; and
   8. forms of communication;

ii. The transportation of materials to the site must fall under the provision of the Republic Act 4136 or "Land Transportation and Traffic Code;"

iii. To move objects as large as the blades of a wind turbine requires special permits, special signs on trucks and flagging, as well as detailed planning must be placed to ensure coordinated deliveries;

iv. A swept path analysis and vehicle turn simulation must be undertaken to help anticipate and avoid dangerous situations and in analysis of road adequacy and obstacles when transporting turbine components;

v. Other options for logistics of turbine, often including multiple modes of transportation must be formulated;

vi. There should be 'dry runs' (real trucks simulating the actual deliveries to site) that can help assess situations that could become dangerous for the drives and other road users;

vii. To avoid main traffic flows, it is preferred to transport turbine components at night; and

viii. Escort vehicles should be used to provide an element of control on road users along particular sections of the route and provide an element of warning and information for other road users about the proximity of the convoy.

b. Construction of Wind Turbines

i. Incorporate community input into wind energy facility layout and siting;

ii. Maintain a uniform size and design of turbines (e.g., type of turbine and tower, as well as height);

iii. Establish setback distances between turbines and populated locations (minimum setback distance is 1.5 x turbine height);

iv. Adhere to country-specific standards for marking turbines, including aviation/navigational and environmental requirements, where available;

v. Minimize presence of ancillary structures on the site by minimizing site infrastructure, including the number of roads, as well as by burying collector system power lines, avoiding stockpiling of excavated material or construction debris, and removing inoperative turbines; and

vi. Implement erosion measures and promptly re-vegetate cleared land with local seed stock of native species.

c. Wind Turbine Blade/s

i. Minimize the probability of a blade failure by selecting wind turbines that have been subject to independent design verification/certification (e.g., IEC 61400-1), and surveillance of manufacturing quality;

ii. Ensure that lightning protection systems are properly installed and maintained;

iii. Carry out periodic blade inspections, cleaning, and repair any defects that could affect blade integrity; and

iv. Equip wind turbines with vibration sensors that can react to any imbalance in the rotor blades and shut down the turbine, if necessary.

d. Crane Safety

i. All cranes, cables, and hoists should be operated and maintained according to the manufactures' specifications for maintenance, operation, and inspection;

ii. All equipment used for crane operation should be inspected daily, before operations start. An Authorized Personnel should make inspections of cables, sleeves and pulleys, boom and boom stops on a regular basis;

iii. No load should be lifted which exceeds the rated capacity of the crane at the operating boom angle;

iv. Cranes operated on soft ground should employ the use of mats. Extreme caution should be used when operating near the edge of an excavation;

v. Slings should be adequate for the load being lifted. An Authorized Personnel will ensure that the proper sling is being used and that it is correctly applied before the lift is made;

vi. Taglines or guide ropes should be used on loads that are liable to swing or must be guided through a restricted space. Care will be taken to guard against injury to work men, structures, etc., from swinging loads;

vii. Cranes should be moved only when directed by a signalman;

viii. Only qualified crane operators should be allowed to operate cranes;

ix. The operator should never leave the machine while a load is suspended;

x. Power should be cut off and all controls locked before the operator leaves the cab. The boom will be lowered to the ground when leaving the machine overnight;

xi. A qualified signalman alone should give hand signals to the crane operator to ensure safe and efficient operation, however, a 'STOP' signal can be given by anyone. These signals will be reviewed prior to the site operations and periodically reviewed during this project;

xii. Cranes & their loads must maintain a distance of 10-feet from overhead power lines up to 50 kV & for every kilovolt over an additional 0.4 foot (0.12 meters) is required;

xiii. Cranes should have swing radius protection in place where applicable;

xiv. Components should be inspected in accordance with manufacturer's specifications;

xv. A lift plan should be submitted for all critical lifts performed;

xvi. Cranes used should have a current annual inspection;

xvii. When using a crane, hands should not be used when the load is being lifted or lowered. Use non-conductive tag line to help direct and position the load; and

xviii. Loads should not be swung over the heads of personnel.

e. Substation and Power Lines

i. Substations shall be protected with fences and appropriate warning signs shall be put in place;

ii. Access to substations shall be limited to Authorized Personnel. In unavoidable circumstances, visitors accompanied by Authorized Personnel can be allowed access, but with the necessary safety precautions and PPE;

iii. Warning signs shall be provided where high voltage power lines associated with powerhouses and substations are located in areas where the public could accidentally make contact with them; and

iv. Clearances for power lines shall be in accordance with appropriate codes/rules.

f. Inverter

i. Connect the grounding connection on the unit to the appropriate grounding system;

ii. Do not place or expose the inverter to rain, water, spray or any kind of contamination. Any source of contamination even dirt can discharge power;

iii. Use caution to reduce the risk of dropping a metal tool on the equipment;

iv. Always check and interconnect the equipment/components in accordance with the specifications and input parameters of the inverter;

v. Check the grid compatibility and condition of the inverter prior to its operation and interconnection to grid;

vi. Do not connect the AC output of the unit directly to an electrical breaker panel/load center which is also fed from the utility power/generator;

vii. Do not connect the inverter to multi-wire branch circuits;

viii. Disconnect all AC and DC side connections before working on any circuits associated with the unit; and

ix. Discharge the capacitors before working on the circuits.

g. Aircraft Safety

i. Consider wind energy facility design options, including geometric layout, location of turbines, and changes to air traffic routes;

ii. Consider radar design alterations, including relocation of the affected radar, radar blanking of the affected area, or use of alternative radar systems to cover the affected area;

iii. Undertake consultation with the relevant aviation authorities to determine prevention and control measures; and

iv. Ensure that wind turbines over a certain height (typically a tip height of 150 meter) are to be fitted with obstacle lights. Installation of these obstacle lights are sufficient for the pilot to recognize danger, take evasive actions and avoid obstacle by a safe margin.

h. Marine Safety

i. Consult with marine regulatory traffic authorities before installation, in accordance with marine traffic safety regulations;

ii. When feasible, avoid siting wind energy facilities close to ports and within known shipping lanes;

iii. Use anti-collision lighting and marking systems on turbines and all other hazards. Consider using guard vessels. Lighting and marking should be determined by relevant marine authorities;

iv. Establish safety zones around each turbine and construction vessel during the construction phase in order to minimize disruption to other sea users; and

v. Use reference buoys to aid navigation.

i. Recreation Areas

i. Isolate areas where recreation activities may be allowed by the local government and where they should be strictly prohibited because of proximity from dangerous project structures and these areas should be away from sudden drop-offs, swift currents, or other dangers using adequate fencing especially in highly used areas; and

ii. Potential hazards and safety problems should be identified and reported to the local authorities to prevent the issuance of permits in these areas for recreation and other activities that will expose people to hazards.

j. Operations and Other Factors Affecting Public Safety

i. Un-manned, remote-controlled facilities may require more safety devices to adequately protect or at least warn the public;

ii. Weather factors, such as rain and fog, can make project surfaces slick and obscure visibility, resulting in signs being less effective. Therefore, other safety warning devices such as lightings may be employed;

iii. During high winds, ways in securing boats and other facilities vulnerable to sudden gusts of winds should be considered; and

iv. Public safety aspects of each plant should be periodically evaluated.

k. Warning Signs, Safety Devices and Measures

Wind power plants, in general, require warning signs, safety devices or other measures depending on the amount of protection necessary.

i. Warning Signs

1. Some structures may require only a warning sign, while another may require safety nets, railings, escape ladders, several warning signs, and the need to be enclosed with a chain link fence. Others may require audible devices, such as sirens, horns, or buzzers;

2. Examples of signage warnings could be: "Stay Alive by Staying Out", "No Trespassing" or "Keep Out", "Danger of Drowning" which can be in English or Tagalog;

3. Size of the letters of the signage must be large enough from the distance they are needed to be first read;

4. Signs to warn of clearance heights should be in place whenever people and equipment are to pass under bridge, overpass, power and communication lines; and

5. Signs should be kept in good condition free from fading, flaking and/or vandalism and from obstructions such as plants, grasses, and trees.

ii. Buoys

1. Individually anchored buoys basically serve as floating signs;

2. Warning buoys and signs should be installed at least 300 feet (91.44 meters) from the structures or at a greater distance, depending on where the hazard begins; and

3. Buoys should be in place to mark special hazards for boaters in reservoirs such as shallow areas, rocks, boulders, temporary structures, outcroppings, etc.

iii. Lighting

1. Other structures may require lighting as a safety device, these may include switchyard, substation, perimeter fence, buoys, float and even boat barriers for night visibility, especially if boating at night is a regular activity. Strobe lights can also compliment audible warning devices; and

2. Beacons can also be used at those areas with heavy boat activities.

iv. Audible Devices

1. Audible warning devices, together with signs should be in place to explain their meaning, at those areas with sudden changes in operation.

v. Other safety measures

1. Other safety measures can be through educating and informing Workers including the public;

2. Setting-up of procedures for safer plant operations is required. Information dissemination can be brochures, company literature, video tapes, television/radio/newspaper articles and advertisements, though announcements in public gatherings and schools, civic and non-government organizations, etc.;

3. There should be change in operating procedures to improve safety conditions at a plant when needed such as modifying gate opening procedures that reduce or eliminate sudden surges in flows or may be used to direct flows to less dangerous areas;

4. Uniformed guards can be employed in some heavily used public areas to implement regulations and warning signs and minimize trespassing and vandalism; and

5. To reduce vandalism and/or malicious mischiefs, wire cables can be substituted for ropes, signs can be stenciled or engraved on concrete surfaces and communication with barangay officials and police can help catch offenders.

Section VI – Separability Clause

In the event that any provision of this Department Circular or the application of such a provision to any person or circumstance is declared invalid, the remainder of this Department Circular and the application of such a provision to other persons or circumstances shall not be affected by such declaration.

Section VII – Resolution of Conflicts and Overlapping Jurisdictions

In case any provision of this Department Circular conflicts, duplicates or overlaps with rules and regulations being implemented by other government agencies, such conflict, duplication or overlapping shall be resolved by coordination or any other means of cooperation among such agencies.

Section VIII – Repealing Clause

All wind safety and health rules and regulations, orders or parts thereof which are inconsistent with or contrary to this Department Circular are hereby repealed, amended, or modified accordingly.

Section IX – Effectivity

This Department Circular shall take effect fifteen (15) days following its publication in the *Official Gazette* or in two (2) newspapers of general circulation.

Fort Bonifacio, Taguig, Metro Manila

ALFONSO G. CUSI
Secretary

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DEPARTMENT OF ENERGY
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