DEPARTMENT CIRCULAR NO. DC _____

HYDROPOWER AND OCEAN SAFETY, HEALTH AND ENVIRONMENT CODE OF PRACTICE

STATEMENT OF AUTHORITY

Pursuant to Rule 2, Section 8 of Department Circular No. 2012-11-009, otherwise known as the "Renewable Energy Safety, Health and Environment Rules and Regulations", and in order to ensure adequate safety and protection against hazards to health, life and property as well as pollution of air, land and water from hydropower and ocean energy operations, the following hydropower and ocean safety, health and environment code of practice are hereby promulgated:

GENERAL PROVISIONS

Section I. Safety, Health and Environment Policy Statement

1. Providing a safe workplace while protecting the health of the workers must be the principal responsibility of the hydropower & ocean Employer. To achieve this, safety and health concerns must be thoroughly integrated in the hydropower & ocean Employer's management policy.

2. The hydropower & ocean 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 organization 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 to ensure that relevant government safety, health and environmental rules, regulations and codes are complied with; and

    e. Establish an emergency plan to address any incident that may pose serious and imminent danger to the company's personnel, the environment and the community.

Section II. Definition of Terms

1. **Accessory Valves** – refers to valves used for vent, sampling point, pressure tapping point and drain valves.

2. **Authorized Personnel- refers to an Employee who has been trained and licensed/certified to do the task, as duly authorized by the Employer.**

3. **Employer** refers to the service/operating contractor referred to in a RE Service/Operating Contract, and other entities, whether government or private, engaged in RE Operations, whether acting alone or in consortium with others, that hires one or more persons to work for wages or salaries;

4. **Employee** refers to any person who works for wage or salary in the service of an Employer;

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

6. **CSEP** – refers to Confined Space Entry Procedures.

7. **Hot Works** – involves welding activities and works involving heat and/or open flame such as a torch, etc.

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

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

10. **SDS**- refers to Safety Data Sheet, which is intended to provide workers and emergency personnel with procedures for handling or working with that 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.

11. **R.A. 6969** – refers to Toxic substances and Hazardous and Nuclear Waste Control Act of 1990

12. **R.A. 8749**- refers to Philippine Clean Air Act of 1999.

13. **R.A. 9514**- refers to Fire Code of the Philippines of 2008.

14. **Safe Work Permit** – written permission to do particular tasks with relatively higher risk to personnel and equipment (high risk tasks includes, but not limited to working at heights six (6) feet and above; near moving objects and/or machine parts; involves handling/use of bladed tools; exposure to heat, radiation and/or chemicals; in confined spaces; near or on bodies of water; under falling deb0ris;

at very high or very low light intensity/illumination; existence of parasites/diseases/wild animals; high voltage; near machines in operation; etc.). Further, determination of high risk tasks could be the risk assessment/s done by the developer.

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

16. **Stroking** – refers to a process done on the valve to check problems; like hard to operate and valve sticking by closing and opening by few turns.

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

Section III. Safety, Health and Environment Practices

A. General Safety

1. Office Safety

a. An office maintenance and housekeeping program shall be in place as prescribed in Section III.A.4 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 should only be allowed in designated area/s. Therefore, employer must provide designated smoking area/s.

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

2. Personal Protective Equipment (PPE)

a. Employers shall have a PPE program in place;

b. Employers 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.;

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

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

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

f. PPE shall be properly maintained in good condition;

g. All Employees shall comply with PPE requirements;

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 exceeds 85 decibels;

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. Aprons, welding gloves, leggings and welding masks shall be worn while performing welding jobs. Head protection shall be worn when necessary;

o. Employees working in areas with excessive temperature due to steam/hot water lines or other well appurtenances shall wear suitable protective clothing;

p. Full body harness and/or lifelines shall be properly worn while working at elevated structures (minimum of 6 ft.), in pits, tunnels, ducts and other confined spaces. Lifelines shall be surely 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 in accordance with existing laws and regulations:

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

b. Domestic and process waste management (generation; collection, segregation, storage and disposal);
c. Storage 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 (e.g. snake, salamander, cats, dogs).

B. Workplace Monitoring and Control

1. Permissible Noise Exposure

a. Employers shall have a hearing conservation program in place for the exposed workers.
b. Employers must comply with noise exposure levels as mandated by occupational safety and health standards.

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 the Philippine Electrical Code;

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 Protection Code; and

d. Adequate ground lighting shall be provided within the working premises.

3. General Ventilation

Suitable atmospheric conditions shall be maintained 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, vapor, or mists at the source.

4. Temperature Extreme

a. All Employees exposed to extreme temperatures shall wear suitable protective clothing;

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 restricted to authorized personnel only.

b. All works and materials emitting radiation, such as radiographic testing and naturally occurring radioactive materials from drilling, shall be covered by appropriate permit and signage.

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 personnel 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 thermosluminescent dosimeters and direct reading dosimeters should be worn by radiographers at all times when they are performing site radiography work;

f. Work should be conducted to the degree possible, when only a minimum number of personnel 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.

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

a. All LOTOTO shall be covered by safe work permits;

b. Only duly qualified and Authorized Personnel shall be allowed to conduct LOTOTO;

c. Required PPE shall be used as prescribed in Section III.A.3 herein;

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

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

f. Apply lockout and tagout on the energy isolating devices with assigned individual lock(s) and tag(s);

g. Activate or install the proper blocking, braking and securing devices of all equipment. After lockout devices have been placed on the equipment, 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;

h. After ensuring that no personnel are exposed and as a check on having disconnected the energy source, operate the push button or other normal operating controls to make certain the equipment will not operate;

i. Notify all affected employees, (including facility personnel where applicable), that the machine or equipment has effectively been isolated and that lockout and tagout devices are in place;

j. After completing the servicing or maintenance and the equipment is ready for normal production operations, check the area around the machines or equipment to ensure that no one is exposed;

k. After all tools have been removed from the machine or equipment, guards have been reinstalled and employees are in the clear, remove all lockout and tagout devices;

l. Operate the energy isolating devices to restore energy to the machine or equipment;

m. Notify all affected employees (including facility personnel where applicable) that the machine or equipment has effectively been energized and is ready for use; and

n. LOTO devices shall not be used for other purposes and should be used only for controlling energy.

D. Electrical Works Requirements

1. All electrical works shall be covered by safe work permits;

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

3. Only Authorized Person shall supervise all electrical works;

4. Only duly qualified and Authorized Personnel shall be allowed to carry out inspection, testing and repair of electrical installations and equipment;

5. There must always be two persons present when working on live equipment (120V and above);

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

7. Required PPE shall be used as prescribed in Section III.A.3 herein;

8. Required clearance shall be observed when working near high-voltage lines or equipment in accordance with the Philippine Electrical Code;

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

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

11. Electrical tools and equipment shall be maintained in a safe reliable condition and shall be periodically inspected or tested;

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;

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

16. First aid and/or emergency response team shall be available during all electrical works;

17. Hazardous electrical wastes shall be properly managed; and

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

E. Demolition Requirements

1. Before any demolition work is started, a competent person experienced in demolition operations must be appointed in writing as the person responsible for all work on site. His duties 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 should be obtained. These should 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 Employees and/or contractors involved. The re-use of salvage materials should 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. Signs bearing the words "Danger - Demolition in Progress" in must be erected at each approach to the barricade;

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

8. 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;

9. 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. should be completely removed prior to structural demolition;

10. All steel construction should 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 should be chained or lashed in place to prevent uncontrolled swinging or dropping;

11. 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;

12. 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

13. 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.

F. Working in Confined Spaces Procedures

1. Develop, implement and maintain standard work processes ensure that work involving the entry of Employees into confined spaces has been assessed and approved of by an appropriately competent person;

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

3. The confined space has been properly isolated and all hazardous energy sources controlled;

4. The atmosphere inside the confined space has been gas- tested by an Authorized Personnel in this order:

    a. Check for Oxygen Content – Oxygen should be at least 19.5% and less than 23.5%.
    b. Check for Combustibles – Flammable atmosphere should be less than 10% of the LEL – (0% is preferred).
    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.
        iii. Any other hazardous atmosphere as determined by the use of the space.

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

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 personal protective equipment shall be provided and made available for use by the worker or workers entering a confined space;

7. No Employee or Employees shall enter a confined space unless a watcher is available who is familiar with the job and in contact with the men at regular

intervals and 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. Each Entrant shall wear a properly calibrated and functioning personal multigas monitor;

10. Where necessary, a six-man rescue team must be in place;

11. All personnel involved (Entrants, Attendants, Entry Supervisor, Rescue Team) 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 should be protected during the day by barricades, and at night by barricades and lanterns, with appropriate warning signs; and adequate means of ingress and egress from any confined or enclosed space shall be provided;

15. Activities involving welding or cutting in confined spaces shall conform with Rule 1100 of the OSHS; and

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

G. Safe Work Permit Procedures

1. Established work permit 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 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 safe work permits on other facilities and equipment on site;

8. Employees affected by the safe work permit 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.

H. Hazardous Materials Handling and Storage

1. Toxic chemicals and hazardous waste/substances shall be properly managed (handling, storage, transport and disposal) in accordance with RA 6969;

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
        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 exposures, 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 health, safety 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, especially those which exhibit peculiarities such as but not limited to ammonia, hydrogen peroxide and caustic soda, shall be stored in a cool and dry area;

7. Wear the appropriate PPE as prescribed in the safe work permit, 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.

I. 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. Use appropriate handling equipment (cart or wheeler) when transferring cylinders.

J. 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 OSHS Rule 1945 (Flammable and Combustible Liquids);

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; and

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

K. Explosives Storage, Use and Transportation

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 to 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. Persons 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.

L. Warehouse Safety

1. Warehouses shall be well ventilated and well lighted;

2. If a warehouse is provided with fire sprinkler system, the maximum height of stock shall conform with OSHS stacking limit;

3. Storage areas shall be provided with adequate fire extinguisher located at strategic places;

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

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

M. Ladder Safety

1. All ladders shall be inspected prior and after use to ensure its good state of repair. Damaged or defective ladders shall be taken out of service immediately, reported to management, and tagged with a warning sign on it so it won't be used until it can be 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 contact 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. Keep your body near the middle of the step and always face the ladder while climbing

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

11. Ladder rungs, cleats and steps must be parallel, level and uniformly spaced when the ladder is in position for use;

12. Ladders must not be tied or fastened together 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, the ladder must be equipped with ladder safety devices or self-retracting lifelines and rest platforms;

14. 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—must immediately be marked defective or tagged with "DO NOT USE" or similar language and withdrawn from service until repaired;

15. Never move, “walk” or “jog” a ladder while you are on it. Climb 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. Only one person should be on ladder at one time;

18. Always move the ladder to avoid overreaching;

19. Use a fiberglass ladders when working on energized equipment or near power lines;

20. Raised ladders should never be left unattended;

21. 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;

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

23. The areas around the top and base of ladders must be free of tripping hazards such as loose materials, trash and electric cords.

N. 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.D hereof; and

5. Required PPE shall be used as prescribed in Section A.3 hereof.

O. Facility Improvement Works

1. Excavation and Filling Works

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

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

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

i. A Civil Engineer/Qualified Professional/or Competent Person 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 6.1 meters must be reviewed and approved by a Civil Engineer or Qualified Professional or Competent Person; and
iii. Protective systems (Shoring, Bracing, Sloping, Benching, and Shields) for excavations 1.5 meters deep shall be designed by a Civil Engineer.

d. Before any excavation is started, available drawings, 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 sites shall be properly barricaded, delineated and provided with proper safety and warning signs;

h. Excavation material shall be kept a distance as prescribed under Rule 1413 of 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 three (3) feet 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 practice;

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 yellow illuminated warning devices and other warning systems are placed around excavations left open at night or where there is a hazard to personnel and the general public;

n. Spoils, materials or equipment that might fall or roll into an excavation or trench are kept at least 1 meter from the edge of excavations, or not less than one-third (1/3) of the depth for excavations deeper than 3.0 m;

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

p. Personnel 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 and emergency response shall be available at all times.

2. Concreting and Structural Works

a. Work permits 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 personnel must meet the training requirements for concreting and structural works;

c. Only Authorized Person 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.3 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 Rule 1414 of OSHS;

h. Lifting procedure shall be implemented for heavy and special lifting works. Lifting and rigging procedures shall be in accordance with Rule 1415 of OSHS; and

i. Rescue plans must be developed for works at height and lifting operations. First aid and emergency response shall be available at all times.

3. Road Works / Earth Moving

a. Only Authorized Person shall supervise all road works;

b. Roles must be clearly defined, and personnel 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.3 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. Work place 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 duly qualified and Authorized Personnel shall be allowed to operate equipment;

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

j. First aid and emergency response shall be available at all times.

4. Piping and Insulation Works

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

b. Only duly qualified and 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.3 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. Work place 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 safe work permits;

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

j. First aid and emergency response shall be available at all times.

5. Hot Works

a. Only Authorized Person shall supervise all hot works;

b. Only duly qualified and Authorized Personnel shall be allowed to conduct hot work;

c. Required PPE shall be used while doing hot works in accordance with Section III.A.3 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. Work place conditions shall be inspected to eliminate or control hazards that may expose the worker to injury and potential property damage;

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

g. All hot works shall be covered with appropriate safe work permits;

h. Remove combustible and flammable materials from the work area;

i. Items that cannot be removed are covered with fire-retardant blankets;

j. Keep the floor clean;

k. Provide welding shields to contain sparks and splatters;

l. 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;

m. The hot work area shall be gas tested by an Authorized Gas Tester 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

n. First aid and emergency response shall be available at all times.

6. Mechanical and Equipment Installation

a. Only Authorized Person shall supervise all mechanical and equipment installation;

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

c. Required PPE shall be used while doing mechanical and equipment installation in accordance with Section III.A.3 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. Work place conditions shall be inspected to eliminate or control hazards that may expose the worker to injury;

f. Only duly qualified and Authorized Personnel shall be allowed to install mechanical equipment;

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

h. All mechanical and equipment installation shall be covered with appropriate safe work permits;

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

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

k. First aid and emergency response shall be available at all times.

P. Motor Vehicle and Heavy Equipment Operations

1. Only duly qualified and Authorized Personnel shall be allowed to operate motor vehicles and heavy equipment;

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

3. 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;

4. 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.
   d. Subjected to scheduled preventive maintenance;

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

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

7. 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;

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

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

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

11. 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

12. A Journey Management Plan shall always be prepared for non-routine trips and journeys with high risks (oversized cargoes) to ensure that driving risks and exposures are minimized and managed.

Q. Hoist and Lifting Works Operations

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

2. Only duly qualified and authorized operator shall be allowed to operate hoist and lifting equipment;

3. Only duly qualified and 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 such as ASME B30.5, OSHA 29CFR1910, 1920, 1926 and OSHS Rule 1415;

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. All operators 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. All operators 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 duly certified mechanics and operators and only qualified and Authorized Personnel 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. Always consider the following:

    a. Proximity to power lines;
    b. Proximity to other personnel 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; and

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. No person shall be allowed to work,

walk through, stand, or stay beneath any suspended load being lifted, moved or lowered.

R. Fire Hazards, Protection and Control

1. General Objective

All hydropower operators shall establish a fire prevention and control program in accordance to RA 9514 aka Fire Code of the Philippines.

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 engineer 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 protection standard;

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. Fire fighting 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. Recommend immediately for repair on any damaged parts.

S. Scaffolding Safety

1. General Requirements

a. Installation, dismantling and structural requirements of scaffolding shall conform to the requirements of all applicable industry and regulatory standards such as OSHA 29CFR1910.23 to 28, 29CFR1910.26.451 and OSHS Rule 1414/DO-128-13;

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 in scaffold erection, moving, dismantling or alteration. Such activities shall be performed only by experienced Employees, trained and certified by any government accredited training and trade test centre;

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. Never erect a scaffold within 10 feet of power lines;

i. Do not ride on rolling scaffold;

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

k. Guardrails shall be 2” X 4” or the equivalent (2” nominal diameter for tubular scaffolds) approximately 42” in ht. with a midrail. Supports shall be at intervals not to exceed 8 ft;

l. Toeboards shall be of 4” in height;

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

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. It 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 personnel using a rolling scaffold must engage the wheel locking devices or block the scaffold against movement when the scaffold is stationary and personnel are working from the scaffold. Moving scaffolding with personnel 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 without a break or offset that would limit a potential fall exposure. Access ladder that exceed 20 feet from the ground level should be place 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 employees, except on large area scaffolds where employees 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 employees;

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 employee. Employees 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 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 wide by 3.8 cm 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 15 cm (6 in.) by 15 cm (6 in.) steel and at least 0.64 cm (1/4in.) 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 2.0 meters (6 ft. 6in.) 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 approx 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. Space ties every other lift and every 6M along the face of the scaffold;
iii. Ties should be fixed with load bearing couplers, as close to the node point as possible;
iv. Take full advantage of any structural features of the buildings e.g. pillars, columns, lintels, rebates, etc. 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. Do not remove tie for any reason 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 extend over their end supports by not less than 15 cm (6 in. and not more than 30.5 cm (12in.);
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 10 cm. (4in.) in height by 2.5 cm (in.) 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 6 meters in height shall be designed by a structural engineer and shall be erected, installed and dismantled by TESDA certified erectors.

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.

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

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.
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

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.

ii.ii. Must be a holder of TESDA prescribed Scaffold Erection NC

T. Machine Shop Safety

1. Only Authorized Personnel are allowed to use the machine shop;

2. Required and appropriate PPE shall be used while working in the shop;

3. Never work alone, use the “buddy system” while working in the shop;

4. No food or drink allowed in the machine shop area;

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

6. Horseplay and/or running are not allowed;

7. Loose jewelry and clothing including longsleeves and ties should not be worn in the shop;

8. Long hair must be tied back;

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. Eye wash and first aid kit station shall be available in a designated place; and

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

U. Tools, Equipment and Machinery Operations

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

2. Appropriate tools shall be used on a specific job;

3. Examine each tool for damage before use and do not use damaged tools. Damaged tools shall be reported to proper authorities and repaired before using it again or disposed;

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

5. Operate tools according to the manufacturers’ instructions;

6. Keep all tools cleaned and stored appropriately when not in use;

7. All portable electrically driven tools shall be properly grounded before use;

8. 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;

9. Air supply shall be shut off when pneumatic tools are not in use;

10. Pointed or sharp tools shall be provided with cover;

11. Do not talk to others while they are operating a machine;

12. Never leave tools unattended, put the tools in the designated toolboxes or cabinets after using them;

13. Never leave a machine while its running;

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

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

16. Never push a cutter towards your body parts;

17. Work piece must always be secured with a clamps or a vise;

18. Never use compressed air without a safety nozzle to clean the machines and/or clothing;

19. Never remove metal chips, turnings or shavings with your hands;

20. Disconnect tools when not using them, before servicing and cleaning them, and when changing accessories such as blades, bits, and cutters;

21. Wear proper apparel for the task. Loose clothing, ties, necklaces, or jewelry can become caught in moving parts;

22. 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

23. Follow the machines user's guide and/or safety manuals. Never overload the capabilities of the machinery.

V. 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 it 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. Not interferes unnecessarily or inconvenience operation or production
   d. Operates automatically or with minimum effort
   e. Be suitable for the job and the machine
   f. Not obstruct 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 against 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.

W. Biological Safety

1. General Requirements

a. All field activities/works shall be covered with appropriate safe work procedures;

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 expose body parts and provide some protection and use walking sticks; and

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

2. Workplace/Field 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 to provide some protection;
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. Don't step over logs or large rocks if you cannot see over them;
iv. Wear long pants, and long-sleeves shirts to provide some protection;
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 to provide some protection;
ii. Wear heavy high top shoes or boots, protective gloves and use walking sticks;
iii. During rest, find a spot with direct sunlight, leech do not exist in dry and hot places;
iv. Avoid connecting your tents with trees and branches; and
v. Avoid going into warm and wet places, leech likes warm and wet places.

V. Emergency and Disaster Management

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

a. Develop site specific emergency and disaster response plans to ensure the safety of our employees, 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 response plans to employees, 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 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 plans with business; and

g. Implement, as and when required, site specific emergency and disaster response 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.

W. Communication

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

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

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

X. 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 health and safety of staff, contractors and the community and which may adversely impact on the environment. Procedures shall enable the Employers to:

a. Every Employer shall report to the Bureau in writing, the result of the investigation of all Lost Time Accidents with major loss / damages in accordance with Rule 4 Section 14 Notification and Reporting of the RESHERR;

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

c. Investigate incidents (including near misses) by trained and competent personnel to identify and analyze root causes and system failures;

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

Y. Health, Environment and Safety Plan

Health, Environment and Safety planning begins with anticipating and understanding health, environment and safety 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 HES Plan, duly signed by the Project Manager and specific to the project. The HES Plan shall describe the health, environmental and safety issues and risks associated with the work;

b. HES 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 HES Plan is required by local regulations, Employer shall not start work without an HES Plan that has been accepted by local authorities having jurisdiction;

d. Prior to starting work, all Employees personnel shall participate in a health, environmental, and safety (HES) 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 persons who will participate in the performance of the work. Employer shall ensure that the JHA has been communicated to and fully understood by all employees as indicated by the signatures of the employees concerned in an attendance sheet of that meeting.

Z. Geohazards Requirements

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

2. 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;

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

4. The team shall meet annually or as the need arise;

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

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

Section IV. Power Plant and Control Room Safety

A. Power Plant

1. Power Plant Safety

   a. All plant personnel shall be qualified and trained in their respective job assignments;

   b. All plant personnel shall undergo occupational safety and health orientation and training;

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

   d. All plant personnel shall be required to wear appropriate and prescribed PPE's;

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

   f. All power plants shall establish work procedures for:

      i. Start-up and Shut-down
      ii. Emergency
      iii. Normal and Abnormal Operation
      iv. Maintenance Work for the following:
         - Headrace
         - Weir
         - Surge tank

- Penstock
- Powerhouse
- Turbines and Generators
- Electrical and Instrumentation
- Tailrace

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

g. All works shall be covered with appropriate safe work permits.

B. Control Room Safety

a. Unauthorized personnel are prohibited from manipulating control panel knobs, buttons, and switches. Bystanders are not allowed inside the control room unless authorized;

b. Keep air conditioning unit running 24 hours a day to maintain the control room temperature and to keep the air clean and filtered;

c. Always close the door of control rooms to reduce outside air infiltration/cooling loads and H_2S contamination;

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

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

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

g. Keep the door of circuit breaker/panel always closed.

C. UPS and Battery Bank Room Requirements

1. Unauthorized personnel are not allowed to enter the room;

2. Air conditioning unit must be operated 24 hours a day at temperature not greater than 15^0C for electronic equipment cooling;

3. Always close the door of UPS and battery bank room to reduce outside air infiltration/cooling loads and H_2S contamination;

4. Keep battery bank free from leaking solutions;

5. Do not use battery room as dressing room;

6. The exhaust ventilation must be placed in the proper portion of wall ceiling to eliminate the explosive gas emitted by the battery;

7. The 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/disposal of unserviceable batteries should be observed in compliance with regulatory requirements.

D. Electrical Power Facilities and Equipment Repair and Troubleshooting

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

2. Always wear safety rubber 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, when troubleshooting and repairing of a particular line running and encased with other lines in metallic cable tray;

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. Hydropower Activities

A. Hydropower Activity Requirements

All Hydropower activities shall comply with the following requirements:

a. Standard Operating Procedure;
b. Orientation/Training;
c. Safe Work Permits;
d. Close Supervision;
e. Monitoring Tools/Instruments;
f. Communication Tools/Equipment;
g. Emergency Response Team; and
h. Personal Protective Equipment.

B. Exploration Stage

1. General Requirements

a. Only Authorized Personnel shall be allowed to conduct hydrological and geophysical survey;

b. The Employer shall designate a qualified supervisor, with minimum Basic Occupational Safety and Health (BOSH) training with DOLE-Accredited Safety Training Organization (STO), as part-time Safety officer during the entire hydrological and geophysical survey;

c. Conduct Daily Safety Meetings to review the project, personnel deployment locations, equipment layout and the Employee's condition; and

d. Check the condition of the service vehicle, communication tools, PPE and peace and order situation of the project site.

2. Composition of a Hydrological Exploration Team

a. At least a pair of geologists, geochemists, geophysicists and/or field technicians, ensuring the use of a buddy system;

b. One lead guide who will ensure that the trail is safe before proceeding;

c. One supplementary guide/sampler who shall function mainly as sweeper;

d. Porters, for rolling camp set-up;

e. An advance team shall be formed to scout and assess the exploration area for accessibility prior the entry of the main exploration team; and

f. Safety officer shall be employed or the team leader be designated as a part time safety officer during exploration activities.

3. Dealing with Various Kinds of Terrain

a. In dealing with various kinds of terrain, the lead guide shall confirm the accessibility of the area;

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

c. For passable terrains with the aid of rope. Setup the rope on sturdy trunk and pass one at a time with caution;

d. For impassable, such as loose ground and/or nothing to hold to, look for alternative route; and

e. The team shall avoid location of traps. If quick sands and aggressive animals are observed, the team must plan a reroute.

4. Dealing with Various Kinds of River

The team shall consider the various types of river when rerouting through it:

i. For calm and mid to shallow river, the lead guide shall assess the slippery areas and sudden changes in river depth, aided by a stick. Then, the team shall thereafter pass one or two at a time aided by the guide;
ii. For raging mid to shallow river, the lead guide shall check for rock boulders as path. If available, check for slippery areas and proceed with caution. If none, the guides shall tie the rope, in a position oblique to the flow. The team shall pass one at a time, holding tightly on the rope; and
iii. For deep but calm and/or raging rivers, the team shall re-strategize.

5. Camp Safety

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

i. Camp location shall be near a water source (~100m) but not too close;
ii. The camp area shall be clear from sharp rocks, glass shards and poison ivy;
iii. The camp area shall be slightly sloping to ensure water drainage; and
iv. The camp area shall have a protection from strong winds.

b. In order for the camp location to be considered as safe from wild animals, the following shall be considered:

i. The camp shall not be set up too close to the water source;
ii. Cooking should be done far from the tents (~100m away) to avoid imparting aroma to the camp area; and

iii. Food stuffs and other aromatic materials to be stored outside the tents; if possible, to hang the said items at a height not reachable by animals.

c. Other safety protocol:

i. 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;
ii. 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; and
iii. All campers must apply insect repellant before going to sleep.

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:
- Check for falling debris and unstable areas prior to getting near the outcrop; and
- The lead guide shall clear the outcrop from plant hazards and unconsolidated debris.

b. For rock sampling:

i. The team shall wear goggles and gloves prior to hammering;
ii. Other team members should also wear goggles. Otherwise, they should position far from the point to be sampled;
iii. Prior to hammering, the geologist or sampler shall ensure that no limb is situated immediately below the rock hang;
iv. For large rock fragments intended to be broken into pieces, the sampler must practice hammering with rock stabilized only by foot (standard geo practice);
v. The edges of the rock sample should be smoothened prior to placing them on the sample bags; and
vi. Filled sample bags shall be placed in a heavy duty sack or bag.

7. Water flow measurement

a. Only Authorized Personnel are allowed to measure water volume/river flow measurements;

b. The exploration team should measure the water volume/river flow at the safest section of the river. Safe river section would mean that it is clear of

other hazards such as falling debris; water level is not too deep and water flow is not raging, too violent or turbid. Team should also be on the look out for snakes, leeches, sharp rocks and slippery rock surfaces.

c. PPE, as applicable, such as, but not limited to boots, life vests, rash guard, sun glasses, caps/hats and gloves should be worn.

C. Development/Commercial/Operational Stage

1. Abrasive Blasting Guidelines

a. Use of blasting equipment shall follow guidelines in Section III.K hereof;

b. Blasting agent must be dry and free from unwanted items;

c. Blaster shall be provided with fresh air supply for breathing and ventilation;

d. Blasting operation shall be done in such a way as to prevent exposure to other personnel not involved in the operation;

e. The compressor operator must be in close coordination with the blasting operator; and

f. The relief valve or plug of abrasive blasting equipment must conform to the standards.

7. Avoidance from Drowning and Falling

a. All areas where hazard of potential drowning and falling may occur (such as, but not limited to forebay, headrace, weir, desilting channel, river channels and surge tank) shall be identified and restricted to authorized personnel only.

b. The said areas shall be equipped with barricades/railings, life vests, boats and/or any other appropriate safety equipment/structure that the personnel can use during their regular duty or during an emergency.

8. Abandonment/Evacuation and Emergency Shutdown of Facility

a. Procedures and equipment (i.e. sirens) for proper abandonment/evacuation and emergency shutdown of facility during natural and man-made disaster/calamities such as, but not limited to strong typhoons, fire, and/or earthquakes shall be formulated/installed and made known to all personnel. This will be made in consultation/coordination with proper government agencies and local government units. The abandoned facility, should be off-limits to unauthorized personnel until the disaster/calamity is over. Re-entry to

facility will be determined by the highest ranking personnel physically present at the facility.

c. Appropriate instructional signs and evacuation floor plans shall be visibly posted at all times in strategic locations.

d. First aid and emergency response shall be available at all times.

9. Construction and Safety Guidelines

Rule 1410 of the OSHS and Department Order No. 13, s. 1998 of DOLE shall be adopted as the code of practice for safety in construction of hydropower and ocean facilities.

10. Safe Work Permit Procedures

a. Established safe work permit procedures shall be implemented in the following works:

i. Electrical and Mechanical Lock-out/Tag-out
ii. Confined Space Entry
iii. Hot Work
iv. Excavation
v. Hazardous Materials Handling
vi. Work at Heights
vii. Major Lifts
viii. Radiation
ix. Blasting

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

i. Permit Number
ii. Authorized permit Originator and Issuer
iii. Date of Issue
iv. Work Description (Area/ Activity Covered)
v. Validity of Permit
vi. Work Precaution Checklist
vii. Protective Measure Checklist
viii. Work Party Acceptance
ix. Emergency Response/Equipment
x. Environment Monitoring
xi. Hazard Identification
xii. Work Carry Over (Turnover of Unfinished Work)
xiii. Sign Off (Closing)

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

d. Permits shall be properly posted in the work area.

e. Work covered by permit shall be immediately stopped if permit conditions is not complied with or violated.

f. An assessment shall be conducted to determine the need for safe work permits on other facilities and equipment on site.

g. Employees affected by the work permit procedures shall be trained on application procedures. Permitting authorities shall likewise be identified and properly trained.

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

11. Abrasive Blasting

a. Use of blasting equipment shall follow guidelines in Section III.F.1 hereof.

b. Blasting agent must be dry and free from unwanted items.

c. Blaster shall be provided with fresh air supply for breathing and ventilation.

d. Blasting operation shall be done in such a way as to prevent exposure to other personnel not involved in the operation.

e. The compressor operator must be in close coordination with the blasting operator.

f. The relief valve or plug of abrasive blasting equipment must conform to the standards.

12. Pressure Relief Valve (PRV) and Rapture Disc

a. Appropriate safety sign shall be installed at the PRV and rupture disc.

b. Unauthorized personnel shall not be allowed to enter within the vicinity of the relief valves and rupture disc.

c. Appropriate protection shall be installed at the tip of the exhaust stack of the PRV and bursting disc. These shall be covered with light materials to prevent rain or foreign objects from going in.

12. Motorized/Pneumatic Valve

Only authorized personnel shall be allowed to operate, stroke or calibrate motorized and/or pneumatic valves.

13. Pressure Relief Valves (PRV)

a. PRV shall be properly calibrated and certified by the manufacturer before installation.

b. PRV shall conform to company's Preventive Maintenance Program.

c. PRV lift and reset pressures shall not be altered or changed without approval from authorized personnel.

d. Alteration or changing of the lift and reset pressure of PRV shall have prior approval of the authorized approving officer from the SGS operations. Maximum settings shall not exceed the manufacturer's recommended set limits.

14. Gauges

a. Gauges and accessories to be used shall conform with the required specifications.

b. Installed gauges shall be properly calibrated.

c. Proper tools and equipment shall be used when replacing gauges.

d. Use appropriate PPE when replacing gauges.

15. Engines

a. Positive lock-out measures shall be provided to ensure that the source of power is not activated during engine repair, inspection or adjustments;

b. All exposed revolving parts such as radiator or cooling fans, belts, flexible drives, generators, water pump pulleys, shafts, couplings and other moving parts shall be provided with adequate guarding to prevent contact;

c. Guarding removed for maintenance purposes shall be replaced as soon as possible and prior to operation of the equipment;

d. Spark arresting devices shall be installed in engine exhaust systems where required;

e. Engines shall be equipped with safety alarms and/or automatic shutdown controls to be activated during emergencies or operational difficulties such as over-heating, low oil pressure and over-speeding;

f. Exhaust manifolds and piping shall be constructed, installed and maintained to prevent exhaust gases from leaking between the engine and discharge

line. The discharge line shall be directed away from the engine and the work area;

g. Areas below engine skids and beneath the sub base shall be kept clear of drained motor oil and filters;

h. The air box drains, on engines so equipped, shall be drained according to the manufacturer's recommendations; and

i. Personnel working in high noise areas shall wear hearing protection.

16. Air Operated Equipment

a. All air receivers (tanks) shall have their maximum pressure limitations stenciled on them;

b. Air tanks shall be drained frequently to prevent accumulation of moisture in the absence of auto drain;

c. A valve shall not be installed between the tank/compressor and the relief valve if it cannot be isolated;

d. Compressed air used for cleaning purposes shall be regulated to limit pressure;

e. Each airline shall be secured to prevent it from coming loose at the connections; and

f. Compressed air or pressurized air shall not be used as a means of dusting off personnel.

D. Hydropower Structures and Proximities

1. Dams

a. Only authorized personnel shall operate dam controls.

b. Warning beacons/sirens, lights/strobe lights shall be turned on whenever possible whenever opening or closing of dams.

2. Weirs

a. Weirs should never be used as passageways.
b. When work is to be done and stepping on the weir is unavoidable, make sure that is clear of any moss or algae formation to avoid a slippery surface.

3. Spillways

a. Subsurface currents may be very rapid and dangerous and may develop whirpools, therefore spillways must have gates as much as possible and raised only a few inches above water surface.
b. Flashboard (or rubber dam) spillways should be regarded with the same caution as overflow spillways.

c. These spillways cannot be seen from the surface, hence they are particularly dangerous to swimmers and scuba divers and therefore proper warning signs are to be placed above and below the said spillway.

d. Caution should be practice with needle beam spillways since they often create a considerable hazard when several beams are removed to spill water. Even with relatively narrow openings, there could be considerable depth and pass a large volume of water creating swift currents.

4. Trash Racks

a. The public should not have access to trash rack areas because they are dangerous, particularly where there is high velocity flow. Nevertheless, adequate safety devices and warning signs should be the first line of protection because there is little or no chance of survival if someone is missed to be caught by a trash rack and goes through the intake.

b. Whenever possible/feasible, a fence should be installed before the trash rack and should withstand any objects that could destroy or damage the trash rack to prevent further harm to the power plant and personnel.

5. Powerhouse Intakes

a. Intakes should be equipped with trashracks that would prevent anyone from being drawn into a turbine.

b. Swimming or boating near intakes should not be allowed.

6. Powerhouse Tailrace Areas

Powerhouse tailrace areas should be clear of persons that are near the said area, or wading or boating in the tailwater areas.

7. Spillway Tailraces

These areas likewise must be clear of persons in the tailwater or along the riverbanks or canals in the immediate downstream area.

8. Canals/Headraces

Avoid slippery canals (especially those with algae outgrowths). Other structures associated with canals may also be dangerous therefore prevention of unauthorized persons and barricades may be necessary whenever applicable.

9. Intake Areas

Unauthorized person should not be near inlets to conduits, tunnels, inverted siphons, or sagpipes since such areas show little visible evidence of the dangerous undercurrents.

10. Boat Ramps

Safety devices and caution should be observed when boat access points to project facilities is located in close proximity to spillways, powerhouses, intakes or canals where rapid or dangerous water currents can exist. Boat ramps in areas of high boat traffic may need signs to control the number of boats and the direction and speed of boat movement.

11. Natural Topography/Channels

Natural topography (protruding rocks, vegetation, caves, etc.) can often obscure the view of the spillway, powerhouse, and other project facilities that can cause individuals to unknowingly enter dangerous areas if access is allowed. Therefore adequate safety warning signs and devices (as applicable) should be provided and should be considered in the general project plan to prevent or at least restrict public access and/or provide safety devices.

12. Substations and Power Lines

a. Substations must be well protected with fences and signs. Where high voltage power lines associated with the powerhouses and substations are located in areas where the public, hikers, tourists, or fishermen could accidentally make contact with them should be provided with warning signs.

b. Sagging of power lines as time passes by should be considered when determining the safe height for the power lines.

13. Bridges (including hanging bridges)

Height of bridges/hanging bridges over project reservoirs/channels must be high enough to prevent any hazard it may pose for boaters/people attempting to pass under them.

14. Surge Tank

The surge tank should be clear of debris so as not to clog it.

15. Forebay

The forebay will be protected with railings or fences to avoid accidental fall into the body of water.

16. Desander/Setling Basin

The desander/settling basin will be protected with railings or fences to avoid accidental fall into the body of water.

17. Fish Ladder

a. Fish ladders should never be used as access by personnel.

b. It should never run dry of water especially during summer or firm flow and should always be cleared of debris.

18. Other Project Hazards

a. Publicly accessible project structures can pose many safety problems unless access to these areas is restricted. Access should be restricted to prevent persons from falling from dams, headrace, wingwalls, or headgate structures into reservoirs or tailrace areas.

b. On the other hand, large boulders and other rip-rap materials on dams, dikes and along river channels can fall onto the public therefore persons should be prevented from being below these hazards.

c. Catwalk structures, hanging bridges used as access structures and slippery spillway surfaces are also hazardous areas that should be avoided by the public.

19. Natural and Other Hazards

a. Avoid natural and other hazards, such as large/old/leaning trees, submerged stumps, protruding rock formations, and concrete structures made weak by inundation.

b. Consideration should be given to marking these hazards with buoys or signs.

20. Recreation Areas

a. 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 dropoffs, swift currents, or other dangers using adequate fencing esp. in highly used areas.

b. Project personnel should therefore identify potential safety problems to the project owner and request that they should inform the local authorities to prevent giving permits in these areas for recreation and other activities that will expose people to hazards.

21. Operation and Other Factors Affecting Public Safety

a. Proper warning and caution should be employed when there is sudden start or stop of operation since it may create sudden water currents esp. at the intake and tailrace.

b. Remote operation or automation of hydro projects may increase the chances of accidents at the projects by eliminating the observations, judgements, and warnings of an operator. However, during severe weather conditions this may be allowed or may be the best operation method to be employed so that the operator/employees will be at a safe distance/elevation whenever the possibility of a flashflood or other imminent calamities that may wipe out the entire facility and its personnel can occur. However, un-manned, remotely-controlled facilities may require more safety devices to adequately protect or at least warn the public.

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

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

e. Because the operation of projects may change and because the public use of many projects continues to increase, the public safety aspects of each project should be periodically evaluated by the owner.

22. Warning Signs/Devices, Safety Devices and Measures.

As a general rule, all hydropower and ocean energy projects will require some type of safety devices, warning systems, safety devices or other measures depending on the amount of protection necessary which increases as personnel and public exposure to the hazards increases.

Each project should be reviewed for public safety needs on a case-to-case and specific basis. Assess the number and type of public safety measures at any project based on the volume and type of public use patterns at the site. Projects that do not have significant and documented recreational or any public use may, for instance, require only minimal public safety measures such as proper warning signs.

Warning and safety devices can include danger and warning signs, bouys, lightings (includes all lights & illumination, beacons and strobe lights), escape ladders, escape devices, safety nets, audible warning devices, and fences..

A. Warning Signs:

a. 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, which are generally used to warn of sudden changes in the rate of flow, usually in tailwater areas of spillways or powerhouses.

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

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

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

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

f. Place warning signs in trash racks, spillways, weirs, forebay, turbines, generators, fish ladders, headrace, low clearances, floor cavities/canals, surge tanks, desilting basin, tailrace areas.

g. Visible and legible warning signs an appropriate distance upstream of and facing the reservoir of each dam.

h. If needed, canoe/kayak and portage signs and routes at projects where boaters and kayakers require portage around the dam. Kayakers should be prohibited from traversing over dams.

i. If determined necessary, signs (at least one) facing the reservoir on each dam with a hazardous spillway, with lighting for night time visibility.

j. Signs posted at surge chambers to warn of sudden discharges.

k. Warning signs posted to warn boaters that may have to pass under low bridges.

l. Appropriate signs and/or fences in the intake areas (trash racks) of powerhouses.

B. Bouys

a. Individually anchored buoys basically serve as floating signs.

b. Warning buoys and signs should be installed at least 300 feet from the structures or at a greater distance, depending on where the hazardous current begin, and closer to the dam if the project reservoir is relatively small.

c. Buoys to mark special hazards for boaters in projects reservoirs such as shallow areas, rocks, boulders, temporary structures, outcroppings, etc.

C. Lighting

a. Other structures may require lighting as the safety device, these may include dams, tailrace areas, substations, and even boat barriers for night visibility, esp. if boating at night is a regular activity. Beacons and strobe lights on the other hand can be utilized near spillway gates and overflow spillways could be activated to provide visual warning when water is being discharged. Strobe lights can also compliment audible warning devices;

b. Beacons at those areas with heavy boat activity such as spillways especially when gates are open or being opened.

D. Escape ladders

a. Escape ladders meanwhile can be located on each side of the safety booms or safety nets or on canals at 250 feet apart to adequately provide for an effective means of escape.

b. Use of safety ladders should always be governed by whether or not they will, in fact, increase public and personnel safety.

E. Escape devices

a. Escape devices can include such items as life vests, safety ropes, escape nets, escape ladders, suspended cables (zip lines).

b. Zip lines provide a means of escape for persons who are otherwise unable to get out of hazardous areas and during emergencies that create impassable areas (such as during fires or floods). Care should be taken in the design of these suspended cables, because a single suspended cable may not be readily visible and could pose a hazard to boat riders.

c. Boats/canoes/kayaks can serve not only as recreational facilities, but also as safety facilities. Boats/canoes/kayaks as well as boat ramps should not be within 300 feet of any dam, spillway, or powerhouse but can be in closer proximity to structures are permissible if it can be shown that their location does not create unsafe conditions.

d. Where safe installation can take place, escape devices installed at about 250 foot intervals in steep-sided or concrete lined canals.

F. Safety nets

a. Safety cables, booms, or safety nets are often necessary for a victim to grab when caught in midstream.

b. The safety nets often consist of woven rope, nylon or wire fencing of sufficient height to reach the normal water surface when suspended from a cable across the entire canal width.

c. Safety nets can be used when canals terminate at hazardous structures such as siphon inlets, powerhouse and penstock inlets, or spillways, etc.

G. Audible Devices

Audible warning devices, together with signs to explain their meaning, at those projects with sudden changes in operation that result in large flows and rapidly changing tail water levels.

H. Other safety measures

a. Other safety measures can be through educating and informing the public aside from the above mentioned methods.

b. Other physical restraining devices and/or escape devices.

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

d. Change project operating procedures to improve safety conditions at a project 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.

e. Restraining devices include boats as restraining barriers, natural barriers such as thick vegetations, trash racks, debris deflector booms, fences, railings, and other similar devices. Uniformed guards can be employed in some heavily used public areas to implement regulations and warning signs and minimize trespassing and vandalism.

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

g. Boat restraining barriers upstream of overflow, gated, flashboard (or rubber dam) and needle beam spillways, powerhouse and canal intake areas, and upstream of natural channels that extend to project structures.

h. Fences at substations and restricted access to hazardous areas around dams and other project structures.

i. Restricted public access to powerhouses, intakes, and other operating structures.

j. Powerline clearances in accordance with appropriate codes/rules.

k. Spillways, intake areas, and tailrace areas sufficiently lighted at night (i.e. perimeter lighting) to be recognizable from the canal line and the reservoir, if appropriate.

I. Pets and Stray Animals

Pets and stray animals include both domestic and wild animals that can cause potential hazard to the facility and personnel of the hydropower facility/site. These include carabaos, cattle, goats, pigs, dogs, cat, rats, rabbits, birds, bats, sharks, dolphins, monkeys, snakes, fishes & jellyfishes, etc.

a. All safety measures should be considered in preventing stray animals from causing harm to facility and personnel but should not violate any law on animal rights and environmental conservation efforts.

b. Fences/nets should be installed where appropriate/feasible.

c. Don't feed, touch or adopt wild animals and be cautious around stray cats and dogs.

d. Personnel should leave wildlife alone and be sure that they do not allow themselves be bitten or scratched by them.

e. Domestic pets such as cats, dogs, birds, etc. Should not be allowed or if really needed (such as guard dogs), they should be vaccinated for rabies and keep their vaccinations current.

f. Keep trash can lids secure since open containers can attract wildlife.

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

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

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Section VI. Ocean Power Facilities and Diving Equipment

a. No unauthorized personnel are allowed to enter ocean power facilities.

b. Only duly qualified and authorized personnel shall be allowed to conduct ocean activities.

c. Only authorized personnel shall supervise all ocean works and materials/equipment used shall conform to the established ocean works/activity codes.

d. Required PPE shall be used as prescribed in Section III.A.2 hereof.

e. Materials, tools and equipment shall be inspected for any wear and damages that may expose the worker to injury.

f. Ocean tools and equipment shall be maintained in a safe reliable condition and shall be periodically inspected or tested.

g. 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.

h. First aid and/or emergency response team shall be available during all ocean activities.

i. Diving equipment must be checked by competent and licensed diver before being used.

j. Keep oxygen tank free from rusts/corrosions and dents.

k. Do not use dilapidated diving equipment.

l. The use of “Buddy System” is a MUST when working in an ocean especially during diving activities and no diving would be done during inclement weather.

Section VII – Separability Clause

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

Section VIII – Resolution of Conflicts and Overlapping Jurisdictions

In case any provision of the Hydropower and Ocean Code of Practice 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 IX – Repealing Clause

All hydropower & ocean safety, health and environment rules and regulations, orders or parts thereof which are inconsistent with or contrary to the Code are hereby repealed, amended, or modified accordingly.

SECTION X – Effectivity

The Code shall take effect fifteen (15) days after publication in at least two (2) newspapers of general circulation.

Fort Bonifacio, Taguig, Metro Manila

June ___, 2018.

ALFONSO G. CUSI
Secretary