Philippine Society of Mechanical Engineers
Western Region Saudi Arabia – Jeddah Chapter

Volume 16, Issue 1
June 2021

The Jeddah Prime Movers

INSIDE THIS ISSUE:

NEWSLETTER TEAM

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Contributors	Lee Bonifacio
	Napoleon Cepriaso
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Editor's Note

The Jeddah Prime Movers Return.

By Engr. Jose Melvin D. Santos

Welcome. It is great to be back.

As the Editor-in-Chief and by the help of the Newsletter team, I am proud to present this year's First issue, Volume 16 of The Jeddah Prime Movers.

Inside this issue are the activities of the Chapter starting with the Induction of the 2021 Board of Directors of the PSME-WRSA JC by the National President Dr. Jeffrey F. Singson that was held virtually; we also had our Thanksgiving & Planning led by the Chapter President Engr. Lee I. Bonifacio held in Obhur last January 7-8 2021; and this year's First Technical Webinar 2021 conducted by our past BOD Engr. Ace Glen Garcia on 28th May 2021.

In the Technical Articles, our Past President Engr. Napoleon M. Cepriaso wrote about Wave Energy in Brief and our Tech'l Affairs Director Engr. Napoleon Castaneda wrote about the procedure on the CPD Self Learning Direct Application.

Despite the limitations brought by this pandemic. PSME-WRSA JC has kept its core and continued its service to the general membership thru webinars, virtual plant tour, community service and now its Newsletter, "The Jeddah Prime Movers", returns.

The President's Message

By Engr. Lee I. Bonifacio

Greetings of peace!

Welcome to PSME-WRSA Jeddah Chapter's official newsletter – "The Jeddah Prime Movers" – ang pagbabalik!

It's been quite a while since the last issue of the newsletter was published. With the initiative and dedication of the current BOD's to deliver and meet the chapters' objectives, and with the help of the COPP's, we are launching this 1st issue of volume 16. This issue highlights some of the chapters' 1st and 2nd quarter chapter activities. It also has a technical write-up and guidelines on CPD application. It is worth reading, may take some of your time but rest assured that it will accompany you while enjoying a cup of coffee or tea in a hot summer day.

Presently, the pandemic forced us to follow various safety protocols that prevented us in meeting physically. Looking at the brighter side, as we should always do, this situation also forced us to look for alternatives and cultivates our resourcefulness.

We have a lot of activities stored for us on the 2nd half of this year. See you all around virtually. Together, we will keep and continue the legacy of PSME-WRSA JC.

Moreover, I would like to express my gratitude to the newsletter team. Congratulations! Every accomplishment always starts with a single step. Looking forward for the next issue.

May God keep us safe, bless us all and guide us in our future endeavors.

PSME-WRSA JC 2021 Executive Officers & Board of Directors


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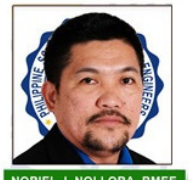
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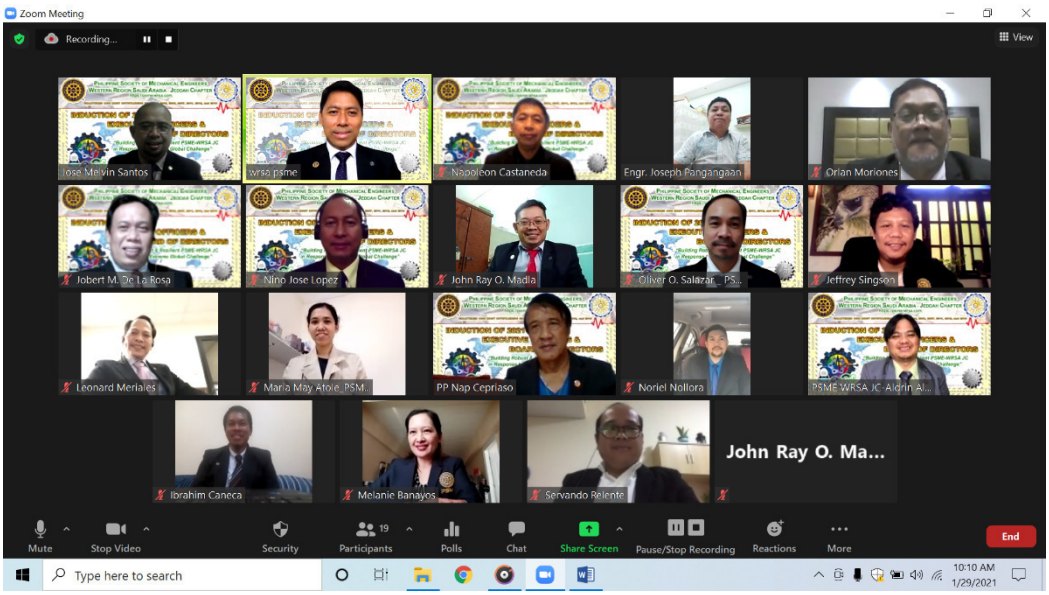
Induction to Office

On 29th of January 2021, this year's PSME WRSA JC Executive Officers and Board of Directors were inducted to office via virtual conferencing.

Present during the event were the PSME National President - Dr. Jeffrey F. Singson as "Guest of Honor & Inducting Officer", VP for Middle East - Engr. Sevando III Relente as "Inspirational Speaker" and National Secretary - Engr. Melanie Banayos as Guest.

With this year's theme "Building Robust & Resilient PSME-WRSA JC in Response to Extreme Global Challenge", the newly inducted Officers & BOD's have accepted the challenge of serving the Chapter for the interest of the General Membership.



Annual Planning & Thanksgiving

On January 7-8, 2021, the PSME-WRSA JC conducted its Annual Planning & Thanksgiving in Obhur. This was the first face to face activity we had after a long time of restriction on gatherings because of the global pandemic.

We had our venue meet-up on January 7 starting @ 4pm. We had dinner, sing-along with the members and family and we shared stories of our fond memories with the PSME-WRSA until late night

The following day, after a good rest, we enjoyed walking along the footbridge of the coast. Some also enjoyed swimming and others stayed in the Villa to prepare our breakfast. We took our breakfast together to energize and get ready for our main agenda, our Annual Plan.

The special meeting started with the ceremonial turnover of the “Gavel” by Immediate past President Aldrin Alizon D. Lango to incumbent Chapter President Lee I. Bonifacio. Pres. Lee then led the presentation and discussion of the annual plans with the Executive Officers & Board of Directors. We all committed to walk an extra mile to achieve our goal.

Finally, after the meeting, we ate lunch together and had the much awaited raffle draws prepared by Sport Director Engr. Julius & Treasurer Engr. Jobert. The prizes made the day and the best finale before going back to our respective homes.

Wave Energy in Brief

By: Napoleon M. Cepriaso, PME, FPSME
March 2021

Introduction

The ocean is an infinite source of energy. Ocean energy (tidal and wave) is the largest known untapped resource of sustainable energy supply. However, tapping this resource has turned out to be a big challenge. Despite dedicated development efforts in both tidal and wave energy over some decades with substantial progress in various domains, technological and non-technological progress in the sector have been slower than expected.

How Wave Energy Works

Ocean waves are generated by wind passing over long stretches of water known as 'fetches'. Three main processes are involved: 1) Air flowing over the sea exerts a tangential stress on the water surface resulting in the formation and growth of waves; 2) Turbulent air flow close to the water surface creates rapidly varying shear stresses and pressure fluctuations, where these oscillations are in phase with existing waves, further wave development occurs; 3) When waves reached a certain size, the wind can exert a stronger force on the upwind face of the wave, causing additional wave growth.

Wave power level is measured in kW per meter of crest length. This measure of wave power is used because the nature of waves makes it impossible to refer to power per unit area as the wave action takes place throughout the depth of water, and so consider the power passing through a one-meter-wide slice of water (Fig. 1).

Difference Between Tidal and Wave Energy

Tidal Energy	Wave Energy
Harnessed from the rise and fall of sea levels.	Harnessed from waves moving along the surface of the ocean.
Caused by the gravitational pull of the moon and sun on the earth.	Caused by wind.
Intensity is affected by location and position of the earth.	Intensity is affected by wind strength. Often referred to as wave power.
Types of tidal energy include kinetic and potential energy.	Types of wave energy include kinetic energy.
Harnessed using barrages, dams, tidal fences and tidal turbines.	Harnessed using offshore and onshore systems.
More reliable since it is based on the gravitational pull of the moon and sun.	Less reliable since it is based on the effect of the strength of the wind on the surface of the water.
Discontinuous source of energy that is generated for about 6 – 12 hours at a time.	Continuous source of energy.
Can disrupt migrating routes of birds and boating pathways and result in large amounts of fish kill.	Effect on surrounding environments, ecosystems and communities are low.
High construction costs but low maintenance costs.	Extremely high start-up costs to design and develop the technology required.

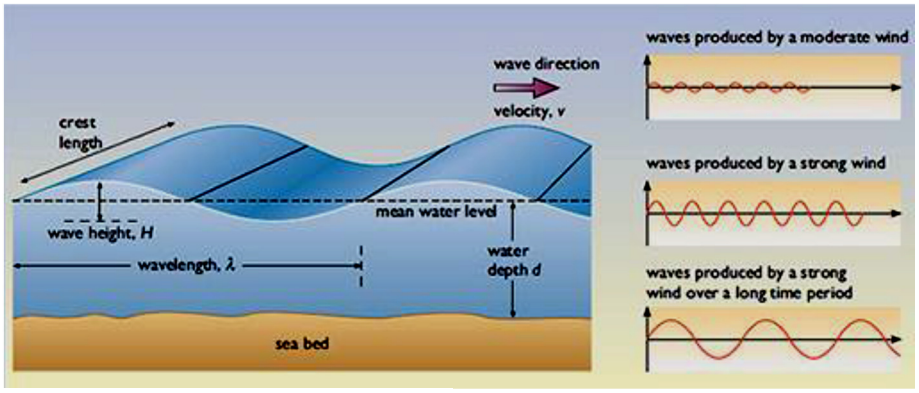


Fig. 1 Wave Characteristics

In terms of wave propagation, water is considered 'deep' when the depth is greater than about half the wavelength. The velocity of a deep-water ocean wave can be shown to be proportional to its period. Hence, the velocity of deep-water wave in meters per second is about 1.5 times the wave period in seconds. As waves approach the shore, the seabed starts to affect their velocity. If the water depth is less than a quarter of the wavelength, then the velocity is equal to roughly three times the square root of the water depth – it no longer depends on the wave period.

The height and steepness of the waves generated by any wind field depends upon three factors: the wind speed, its duration, and the 'fetch', i.e. the distance over which wind energy is transferred into the ocean to form waves. The surface profile of the ocean is the obvious evidence for the existence of waves, but we also need to understand the sub-surface nature of waves if we are to design schemes to capture energy from them (Fig.2a).

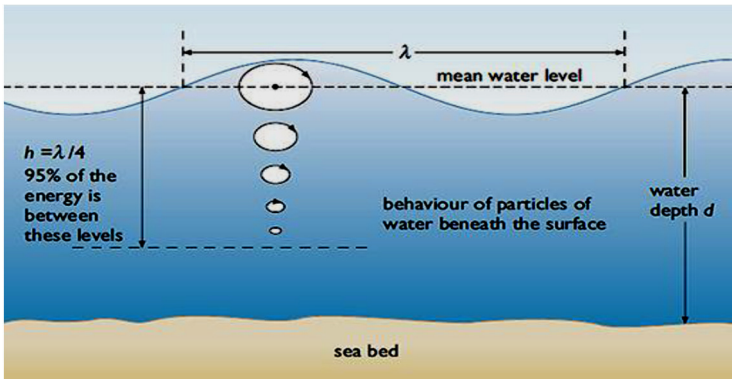


Fig. 2a Behavior of Water Particles Beneath the Waves

Cont… Wave Energy in Brief

Waves are composed of orbiting particles of water. Near the surface, the orbits are the same size as the wave height. The orbits decrease in size deeper below the surface and it decreases exponentially with depth. 95% of the wave energy is contained in the layer between the surface and a depth equal to a quarter of the wavelength (Fig. 2a).

A surge phenomenon (Fig. 2b) occurs when waves approach the shoreline. Waves in deep water are essentially water particles moving in a circular motion. As waves approach the shore, they start "shoaling" as some of the water particles moving in a circular motion meet the seabed. This interaction with the seabed elongates the circular motion into a horizontal elliptic shape. This in turn amplifies the horizontal movement of the water particles in the near-shore area, creating a strong surge zone.

Only few areas in the world have steep cliff shoreline that drops into reasonably deep water. The incident waves have a high-power density making this most suitable for shore-mounted wave energy converters. For most coastlines around the world, near-shore water is quite shallow. Due to the frictional coupling between the water particles at the greatest depths with the seabed, deep water waves gradually give up their energy as they move into shallower water and eventually run up the shore to the beach. This power loss reduces the total wave energy resource. Typically, waves with a power density of 50 kW/meter in deep water might contain 20 kW/meter or less when they are closer to shore in shallow water. Further, as waves run up the beach, breaking waves are formed which are turbulent and energy-dissipating (another form of energy loss). Fig. 3 shows estimates of the average wave power density at various locations around the world.

The areas that are subjected to regular wind fluxes are those with the largest wave energy resource.

To capture energy from sea waves, it is necessary to intercept the waves with a structure that will react in an appropriate manner to the forces applied to it by the waves. In a shore-mounted device the structure is fixed to the seabed and the waves make water move in a useful way. For other types of device, some part of the structure may be fixed, or anchored to the seabed. Another part may be a float that moves in response to the waves by pulling against the anchor. In this case the relative motion between the anchor and the float provides the opportunity to extract energy. Very loosely tethered floating structures can also be employed, but a stable frame of reference must be established so that the 'active' part of the device moves relative to the main structure. This can be achieved by taking advantage of inertia, or by making the main structure large enough to span several wave crests, hence remaining reasonably stable in most sea states.

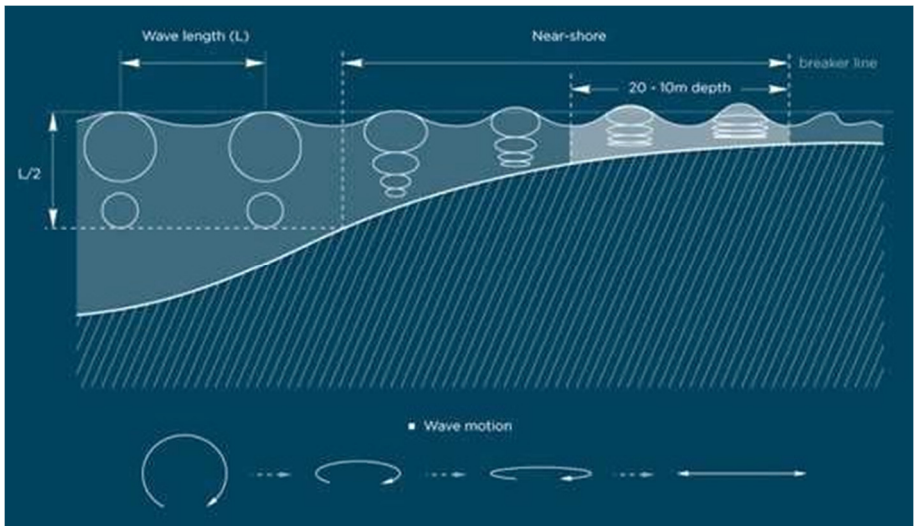


Fig. 2b Behavior and Motion of Waves at Various Depth

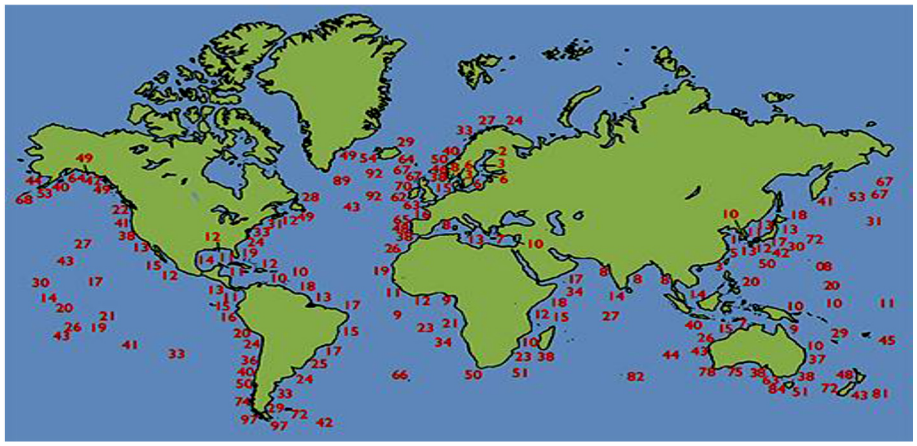


Fig. 3 Annual average wave power in kW/m of crest length around the world (Source: Claeson, 1987)

Cont… Wave Energy in Brief

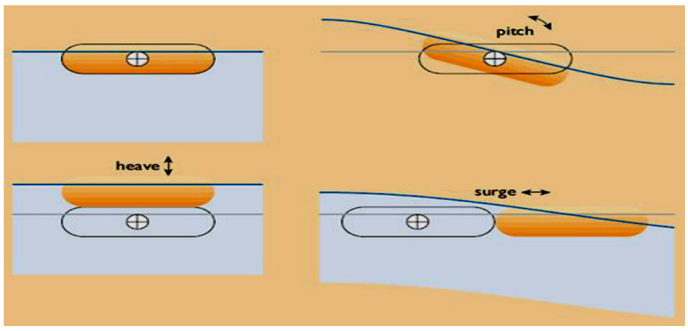


Fig. 4 The pitch, heave and surge responses of a floating object to incident waves

A body in the sea subject to waves can respond to six types of movement. Sway, roll and yaw, are not generally harnessed in wave energy conversion technology. The movement harnessed to varying degrees in most wave energy converters are (Fig.4):

1. pitch – waves cause the device, or part of it, to rotate about its axis.
2. heave – waves cause the device to rise and fall vertically, though these devices have too high a natural frequency to be particularly effective.
3. surge – waves cause the device to move horizontally backwards and forwards. Theoretically, surging motions are twice as energetic as heaving ones, making it preferable to harness this component of waves.

How the wave movement is converted into energy is the heart of the system. There are different configurations of wave energy converter and several ways of classifying them were proposed as follows:

1. Classified by mode of operation (Fig. 5)
   - heaving float
   - heaving and pitching float
   - pitching device
   - oscillating water column
   - surge device

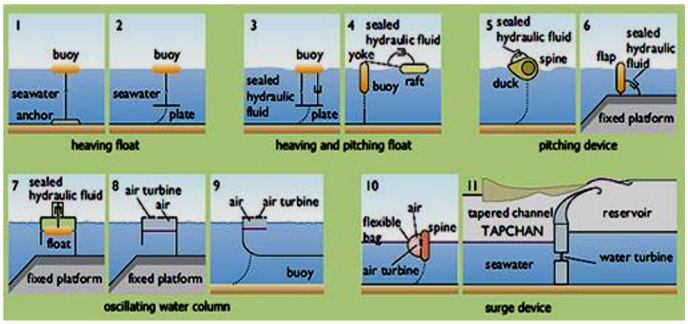


Fig. 5 Schematic representation of various types of wave energy converter classified by mode of operation (source:Falnes and Løvseth, 1991)

3. Classified by device location (Fig. 6):
   - fixed to the seabed, generally in shallow water (e.g. TAPCHAN)
   - tethered in intermediate depths (e.g. Oyster)
   - floating offshore in deep water (e.g. AWS-III).

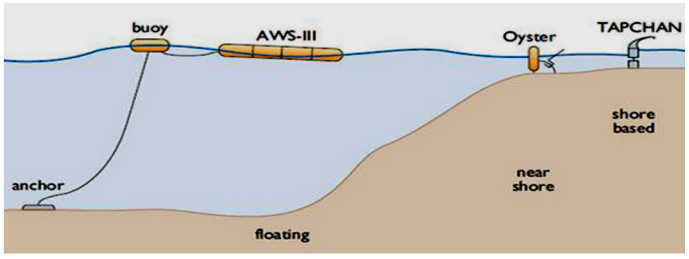


Fig. 6 Classification of wave energy converters according to location

2. Classified by geometry and orientation (Fig.7):
   - terminators
   - attenuators
   - point absorbers

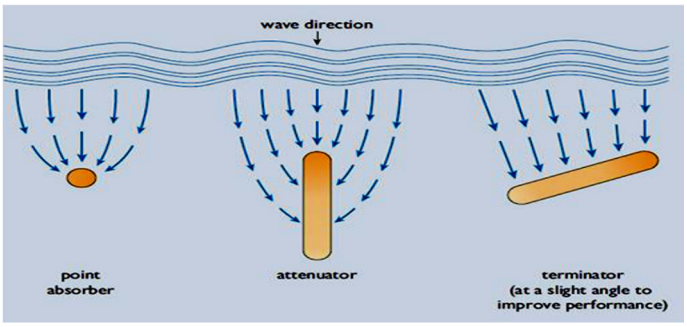


Fig. 7 Classification of wave energy converters according to size and orientation

Wave energy is considered to be environmental-friendly and if the technology can be successfully developed it could become commercially attractive to investors. As mechanical engineers, let us challenge our knowledge of hydraulics, power take-off and mechanics to come up with a solution in its development.

Sources: The Open University and other websites

About the author:
Napoleon M. Cepriaso is a Professional Mechanical Engineer and Fellow Awardee of the Philippine Society of Mechanical Engineers (PSME), and a 2-time TOME Awardee. He is currently the Senior Projects Manager of EgPhil Solar and Renewable Energy Solutions, Jeddah, Saudi Arabia.

1st Technical Webinar on Future-Proof Buildings for the Changing Climate

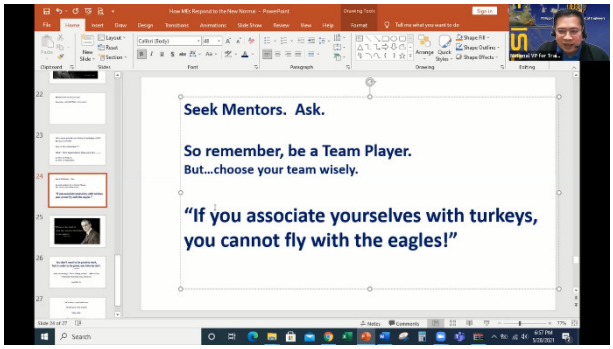
The 1st Technical Webinar was held last May 28, 2021 through virtual platform Zoom.

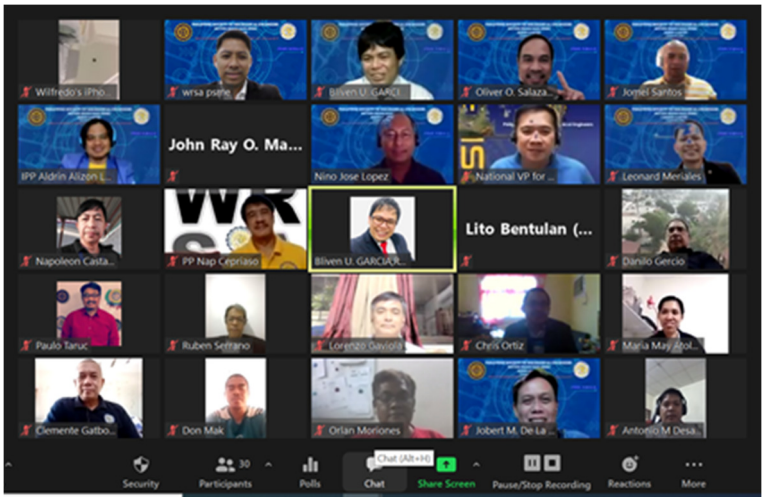
Inspirational Speakers were:

Engr. Eric Marren A. De Luna, PME
PSME National - VP Foreign Affairs

Engr. Ruben S. Serrano, PME
PSME-JWR Charter President

Technical Resource Speaker
Engr. Ace Glen Garcia
PMP, EP, LEED AP, WELL AP, Mechanical Designer and Energy Modeling Lead at MAT 4Site Engineers in Toronto, Canada.





CPD Self-Learning Direct Application

What is Self-Directed Learning?

SELF-DIRECTED LEARNING is a process in which individuals take initiative with or without the help of others in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies and evaluating learning.

Implementation of the Continuing Professional Development Act of 2016 - PRC

The Continuing Professional Dev't (CPD) of the Professional Regulation Commission (PRC) activities under the category of Academic Track and Self-Directed Track shall be applied for to earn CPD credit units under the Self-directed and/or Lifelong learning.

Self-Directed and/or Life-long learning activities :

a. Invention / Patent
b. Post Graduates Studies
c. Authorship
d. Diploma Program
e. Online Training
f. Seminar / Technical Session / Conference
g. Company sponsored training
h. Professorial Chair

Cont. CPD Self Learning…

Procedure for Crediting of Self Directed and/or Life Long Learning:

Step 1: Secure Application Form at Windows 15, 16 or 17 of the Registration Division, PRC-PICC or at any of the Regional Offices, or download at PRC website (www.prc.gov.ph)
Step 2: Fill out Application Form and comply the required documents. (Please provide one (1) set for receiving copy.
Step 3: Proceed to Window 15, 16, or 17 of the Registration Division, PRC-PICC, or any of the Regional Offices for evaluation and assessment.

Step 4: Pay prescribed fee (in cash, Postal Money Order, Manager's Check, Bank Draft payable to Professional Regulation Commission) of Five Hundred Pesos (P500.00)
Step 5: Affix documentary stamp on the application form.
Step 6: Submit Application Form with attached supporting documents and photocopy of official receipt to Window 15, 16, or 17 of the Registration Division, PRC-PICC, or at any of the Regional Offices.
Step 7: Verify your application after 60 days from time of submission by calling telephone numbers 310-10-48 (PRC-Main) 810-84-15 (PRC-PICC) or email at prc.cpdsecreteriat@gmail.com

Checklist of Requirements:

- Original and Photocopy of Certificate of Attendance
- Program of Activities
- Diploma / TOR / Certificate of Completion etc
- Certificate of Patent
- Copy of published material book
- Certificate of Entitlement (Appointment as Chair)
- Others that may be required by the CPD Council

Additional Requirements:

- Soft copy of the Application including supporting attachments in PDF format saved in CD
- Pre-paid pouch (preferably from Philpost) for applications filed in Regional Offices only.

Supporting Documents:

Comply / Submit only the document/s required to support your application. Refer to the Matrix of CPD Activities and/or in the Operational Guidelines of your profession for guidance. (This can be viewed at www.prc.gov.ph under the Continuing Professional Development tab)

NOTES:

1. Application for CPD Credit units of Master's degree or its equivalent and Doctor's degree or its equivalent shall be filed not later than five (5) years from completion of the said degree.
2. Representative/s filing and claiming application/s for crediting of self-directed and/or lifelong learning in behalf of the applicant must present a letter of authorization and valid identification cards of both the applicant and the representative.
3. The period for processing the application is 60 days.
4. If additional requirement/s is/are needed, a period of 15 days is given to submit the same. Failure in comply within the period shall be construed as abandonment of application and the prescribed fee shall be forfeited in favor of the government.

This information is in reference on the **MEMORANDUM from Professional Regulation Commission, Manila dated February 22, 2018, as the subject **"GUIDELINES ON THE PROCESSING OF APPLICATION UNDER SELF DIRECTED LEARNING "***

JOKE BOX

Smart answer by a female passenger on a flight...

A guy asked a beautiful lady sitting next to him... 'Nice perfume.....which one is it?... I want to give it to my wife..!!'

Lady: 'Don't give her....some idiot will find an excuse to talk to her..!!'

A letter from a teacher to a parent:

Dear Parent, Edward doesn't smell nice in class. Please Try to bath him.

Parent's answer:

Dear Teacher, Edward is not a rose, Don't smell him,Teach him .....

A cute excuse:

Teacher: Why are you late?

Student: Mom & dad were fighting.

Teacher: So what makes you late if they were fighting?

Student: One of my shoes was in mom's hand, and the other in dad's..

Wife: I hate that beggar.

Husband: Why?

Wife: Rascal, yesterday I gave him food. Today he gave me a book on "How to Cook !!!

Husband came home drunk. To avoid wife's scolding, he took a laptop & started working.

Wife: Did u drink?????

Husband : no!

Wife: Idiot!!! then why are you typing on a suitcase?!!!