DEFIBRILLATORS– THE FINAL CHOICE TO SAVING LIFES

by Ir. Ir. Shamila Ariaratnam

Ir. Shamila Ariaratnam is a committee member of Electrical Engineering Technical Division (EETD).

On 11 December 2021, at 9 a.m., approximately 50 participants joined Ir. Ts. Lau Yew Nen to discover the ins and outs of an unsung hero – Defibrillator. There are two main cardiac life support devices, namely pacemaker and defibrillator.

Before dwelling further into the parts of the defibrillator, Ir. Ts. Lau explained the main functions of both devices and also temporary external transcutaneous pacing devices.

Defibrillators in the process of saving lives convert certain heart arrythmias to normal, predominantly ventricular fibrillation back to normal and monitor all patient parameters to ensure effective treatment. A block diagram was used to describe the charging mechanisms in the defibrillator. Although the defibrillator is meant to save lives, nevertheless, it poses special hazards despite being regularly maintained. Some of the mishaps shared were microchip failure, battery failure, or battery not being fully charged, power supply or charging circuit failure, inadequate energy delivery and non-compatible pad connections. Maintenance requirements are always based on manufacturer recommendations. However, in the event the information is not available, risk assessment tools can be used to determine the test frequency. He briefly explained the acts, regulations, standards and best practices related to the defibrillators.

Transthoracic impedance (TI) is the body's resistance to current flow. Since each individual TI is different, testing for various impedance values during maintenance must be done to accommodate this factor. Circuit diagrams were used to explain defibrillation efficacy. He also explained the mono-phasic and by-phasic types of technology used and the waveform produced by both types of defibrillations.

Ir. Ts. Lau walked through each and every test done on the defibrillator with the aid of diagrams and flow charts and clarified the different international electrotechnical standards used for the test and its appropriate usage. He made the talk engaging by getting participants involved in answering questions using the chat box and also getting them to do a simple risk assessment calculation to determine the frequency of testing.

The session concluded with two video presentations on the qualitative and quantitative tests performed on the defibrillator during regular maintenance and the methodology of connection from the defibrillator to the test equipment.

A short exchange of ideas between the moderator Ir. Shamila Ariaratnam and Ir. Ts. Lau Yew Nen on the recommended maintenance frequency for defibrillators.